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IDENTIFICATION AND EVALUATION OF CHARACTERISTICS OF KINDERGARTEN CHILDREN THAT FORETELL EARLY LEARNING PROBLEMS. FINAL REPORT.

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TO EVALUATE THE EFFECTIVENESS OF A KINDERGARTEN PROGRAM OF SPECIFIC TRAINING RELATED TO MOTOR, SENSORY, AND PERCEPTUAL (M-S-P) PERFORMANCE, AN INSTRUMENT WAS DEVISED TO MEASURE THE M-S-P NEEDS AND STRENGTHS OF INDIVIDUAL PUPILS. RESEARCH WAS CONDUCTED TO TEST THE DIAGNOSTIC AND PREDICTIVE POTENTIALS OF THE M-S-P INSTRUMENT AND TO ASCERTAIN THE DEGREE OF INDEPENDENCE AND SPECIFICITY AMONG ITS VARIOUS DIMENSIONS. THE M-S-P TEST, THE METROPOLITAN READINESS TEST, THE PINTNER-CUNNINGHAM ABILITY TEST, AND A 52-ITEM TEACHER RATING SCALE WERE ADMINISTERED IN PRE- AND POSTTESTING TO 412 STUDENTS IN SEVEN EXPERIMENTAL AND SEVEN CONTROL CLASSES. SPECIFIC TRAINING IN MOTOR, KINESTHETIC, TACTILE, AUDITORY, VISUAL, AND GRAPHIC ACTIVITIES WAS PROVIDED FOR THE EXPERIMENTAL CHILDREN DURING A 24-WEEK PERIOD BETWEEN PRE- AND POSTTESTING. ANALYSIS OF PRE- AND POSTTEST DATA DEMONSTRATED THE LIMITED EFFECTIVENESS OF THE EXPERIMENTAL TRAINING PROGRAM. THE VARIOUS DIMENSIONS OF THE M-S-P TEST EXHIBITED ONLY PARTIAL SPECIFICITY AND THE PREDICTION OF YEARLY PROGRESS IN INDIVIDUAL M-S-P PERFORMANCE WAS NOT FOUND TO BE FEASIBLE WITH THE PRETRAINING MEASURES EMPLOYED IN THIS STUDY. THE M-S-P TEST WAS, HOWEVER, DEMONSTRATED TO BE A USEFUL INSTRUMENT FOR THE IDENTIFICATION OF PUPILS EXHIBITING DISABILITIES AND/OR DEVELOPMENTAL DELAYS INDICATIVE OF A LACK OF READINESS FOR ACADEMIC ACHIEVEMENT. STATISTICAL DATA ARE REPORTED IN 16 TABLES. THREE APPENDIXES CONTAIN INSTRUCTIONS FOR THE ADMINISTRATION OF THE M-S-P TEST, DESCRIPTIONS OF SPECIFIC TRAINING ACTIVITIES, AND THE FORM EMPLOYED IN TEACHER EVALUATION OF THE SUBJECTS. (JS)

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Identification and Evaluation of Characteristics of Kindergarten Children that Foretell Early Learning Problems

Cooperative Research Project No.S-353
Small Contract Program
Bureau No. 5-8053

William K. Reece
Principal Investigator

Rowland School District and
University of Southern California

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FINAL REPORT

TITLE

Identification and Evaluation of Characteristics of Kindergarten Children That Foretell Early Learning Problems

Cooperative Research Project No. S-353 Small Contract
Program-Bureau Number 5-8053

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William K. Reese
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I. THE PROBLEM

The major problems upon which this investigation focused was to determine the effectiveness of motor, sensory, and perceptual (M-S-P) activities within the kindergarten program.

An initial question to which the research addressed itself was the nature of M-S-P performances of kindergarten pupils. One task was to establish normative data relative to certain types of motor, kinesthetic, tactile, auditory, visual and graphic behavior. Our previous experimentation had strongly indicated that the pupils doing well on a limited survey of perceptual-motor activities gave greater promise of academic achievement. This was particularly true in respect to reading readiness. Therefore, it was reasonable to expect that a broader range of M-S-P assessments would lead to a more comprehensive prediction of achievement potential.

The educational program for the kindergarten and primary grades has been increasingly explored by investigators for the correlates of future achievement. It is generally recognized that pupils cannot be expected to enhance their readiness level on the basis of maturation alone. Consequently, there is a very pressing need for organization of evaluation techniques around a central concept of academic readiness and achievement. Ismail, Kephart, and Cornell (1963), have shown the relevence of motor aptitude tests to achievement for fifth and sixth grade pupils. Selected motor performance tasks such as hopping, skipping, jumping, balancing, and others were shown to correlate between .69 and .86 with achievement scores for the upper elementary level. Ilg and Ames (1964), have selected a testing battery of items to assess school readiness that include visual, graphic, laterality, interview-questions, projective techniques and dentition. They reported normative data in the form of percentages of pupils performing specific criteria for ages from four to ten. However, it is not always clear to educators responsible for the primary phases of the school program how to interpret and implement training of these various processes even if a pupil is not performing like a high percentage of his age mates.

The questions of concern to educators in their efforts to establish a sound developmental approach toward the kindergarten school experience would most likely be as follows:

(1) What are the more significant correlates of future academic achievement that are measurable at the kindergarten level?

(2) How can school personnel most efficiently evaluate diagnostically the potential achievement of kindergarten pupils?

(3) What programing will be of value in effectively coping with needs that are manifested by evaluation efforts?

The present investigation has postulated: (1) that certain basic

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M-S-P processes are crucial to the development of readiness for academic achievement and, (2) that specific training can be of significant value when pupils manifest certain developmental delay in their M-S-P performance.

In an attempt to explore these concerns of educators the study was designed to implement both evaluation and programing procedures.

Evaluation procedures not only reveal readiness but simultaneously indicate various degrees or levels of maturation and performance. Such variances suggest the necessity for differing types of programs. This is particularly true if the evaluation procedures are of a diagnostic nature and not primarily cut-off determination. It is of little value to simply evaluate pupils if no consideration is given to the curriculum in terms of what has been determined about pupils learning. On the other hand, a program designed around the manifested needs of particular pupils has the advantage of providing an early opportunity to institute needed remediation.

It was this problem of implementing both evaluation in fourteen classes and programing in seven experimental classes that comprised the major portion of the investigation. In relation to this problem the project was in several respects comparable to a feasibility study.

An issue about which there remains considerable diversity and controversy is the fundamental role of kindergarten in the public schools. It's place in our society has been viewed with a range of perspectives. Kindergarten has not been nationally provided for. Some areas commence school at a first grade level entirely omitting kindergarten. Kindergarten is sometimes viewed as primarily a play experience, or as introduction to school. Others see it as a unique and separate experience intentionally divorced from any sequential school organization. Still others regard kindergarten as preparation for first grade or insist that kindergarten commence at an earlier age. It is evident that the purpose and program for kindergarten will vary according to the attitudes of those responsible. The present study wished primarily to explore the feasibility of viewing kindergarten as a developmental program. For example, an investigated question was whether or not kindergarten pupils can be trained to perform more effectively in the motor, sensory, and perceptual areas.

From the literature and various standardized tests there are a number of indicies established as to expectancies that are reasonable for four and five year old children. However, the most clearly defined norms are measures in the areas of intelligence and academic achievement. There is not equally definitive measures in relation to the kinds of achievement generally expected to result from kindergarten. For example a kindergarten pupil is likely to experience the following type of activities:

(1) Learning various songs, rhythm instruments, and simple

skill games.

(2) Learning to cut with scissors, paste, string beads, tie his shoes, button and unbutton clothes.

(3) Learning to draw, paint, finger paint and write his name.

(4) Learning certain stories, count to a hundred, tell where he lives and know what day it is.

(5) Learning to make numbers and letters and recognize these.

It was recognized that some of the less verbal areas of achievement anticipated during the kindergarten year can be conceptually categorized within six basic performance areas:

(1) Motor

(2) Kinesthetic

(3) Tactile

(4) Auditory

(5) Visual

(6) Graphic

Therfore, assessment in each of these categories would provide data concerning performance expectencies relating more directly to the kindergarten curriculum.

The time allowance for the kindergarten day is often limited for financial, administrative, and maturational reasons. The limited time factor requires a selective process among the many possible activities available to pupils. It behooves educators to search out the most direct means of achieving kindergarten objectives. The design of the present research was to provide a comparative evaluation of specific M-S-P processes utilized during the daily activities. It was possible to determine the affectiveness of incorporating selective activities that were developed to enhance pupils M-S-P functioning. Moreover, data from control classes have provided a comparative analysis as to the degree of affectiveness.

There exist in many California school districts programs for the gifted minors, the mentally retarded minors, the educationally handicapped minors. It is axiomatic that early recognition, identification and evaluation of exceptional pupils offers better probabilities of successful and appropriate programing. From the several types of performance presently measured and rated it is possible to identify pupils potential eligibility for such programs. In addition initial diagnostic indications have been explored and certain strengths and weaknesses normally not assessed have been appraised.

Perhaps the major educational challenge of the times is to pursue ways of individualising the school learning experiences so that a greater portion of pupils come to realise their educational potential. Within the framework of this investigation, a focus was drawn on the part that certain neurological functioning plays in respect to achievement predictions. Pupils were assessed in the following categories

(1) Mobility

(2) Laterality

(3) Directionality

(4) Spatiality

(5) Differentiation

(6) Temporality

When each of these categories are combined with the six previously described performance categories if forms a matrix composed of thirty-six cells. These cells are illustrated in the following diagram:

MATRIX

MOTOR-SENSORY-PERCEPTUAL RESPONSE SYSTEMS

		Motor	Kinesthetic	Tactile	Auditory	Visual	Graphic
CNS - FUNCTIONS	Mobility						
	Laterality						
	Directionality						
	Spatiality						
	Differentiation						
	Temporality						

Analysis of the matrix measures in both directions for individual pupils was proposed as a means of identifying the specific types of performances and categories of CNS functioning that characterize the pupil as a potential achiever. In essence, the problem of specific and individual pupils description was approached by identifying the following aspects of their M-S-P measures:

(1) Categories of strengths

(2) Categories of weakness

(3) Areas of needed remediation

(4) Relationships with I.Q. (Pintner Cunningham), reading readiness (Metropolitan Reading Readiness), and teacher ratings.

(5) Effectiveness of experimental training activities.

Comparative prognostication was described in respect to identification of pupils that will be least likely to adequately progress during the first grade year. This will be comparative in the sense predictions will be based separately on (1) M-S-P measures, (2) Pintner Cunningham measures, (3) Metropolitan Reading Readiness and (4) teacher ratings.

II. OBJECTIVES AND HYPOTHESES

As the project progressed it was possible to establish more clearly the formulation of the major objectives sought.

During the interim period between the initial proposal and commencement of the project, it was necessary to make some revision in the scheduling and procedure. Consequently the objectives are somewhat modified from those initially proposed. However, the essential purposes as contemplated have remained.

Objective #1

The primary objective was to develop the concept inherent within the M-S-P matrix. It is apparent that the matrix was designed to organize conceptually some of the predominant developmental performances and functions of pupils. The purpose was to outline a scheme that could be utilized to assess some of the underlying processes upon which educational achievement is predicated. In effect many of the kindergarten curriculum expectancies cited earlier are not reasonable if a pupil is unable to perform well on the M-S-P tasks embodied within the matrix. For example, the relatively simple activity of cutting and pasting requires fine kinesthetic control in order to cut along a line, dip and smear the paste, and secure a piece of paper in the proper place. In addition the cutting and pasting accuracy brings into use visual management of directionality, spatiality, differentiation and possibly temporality along with the kinesthetic effort of hands and arms.

This objective involves the issue of whether or not a pupil's task-response behavior can be selectively measured in accordance with the described matrix or are the columns and rows so highly interrelated that a generalized global type of measurement was secured.

In the form of a hypothesis the results were anticipated as follows:

(1) Pupil's motor, kinesthetic, tactile, auditory, visual and graphic performances can be differentially measured by the thirty-six specially designed tasks.

(2) Pupil's functioning on the same thirty-six tasks can also be differentially measured according to the involvement of mobility, laterality, spatiality, directionality, differentiation, and temporality.

Objective #2

Sequentially dependent upon the first objective is the notion that if discriminate M-S-P performances can be identified, it follows that such performances may be improved by specific training. The role of sensory stimulation and sensory deprivation has been demonstrated to have varying consequences depending upon the age, time, intensity, and extent of deprivation or stimulation. It is generally recognized that within limits the neurophysiological development responds to direct excitation.

Approximately one hundred classroom training activities were therefore designed in correspondence with the initial M-S-P matrix assessment tasks. Description of the tasks and training activities are given in detail in appendicies A and B. It was proposed that experimental pupils provided with the training activities would demonstrate improved performance in the assessment tasks. In contrast, control pupils were provided with a typical kindergarten program and consequently improvement of the control group would not be the results of selectively designed activities. This proposition was the basis for the second hypothesis:

> That pupils of the experimental classes will show a significant retest gain in M-S-P performance over the pupils of the control classes.

Further analysis will be made in respect to sex, I.Q. Reading Readiness, teacher ratings, and for particular segments of the population.

Objective #3

The third objective had to do with the identification of pupil characteristics that relate to potential achievement.

The characteristics sought are those M-S-P indicies that reveal a performance disability, or developmental delay. The assumption being that the battery of individually administered M-S-P tests will have provided comprehensive measures of response behavior. These measures will in turn indicate the areas that relate to a potential lack of achievement, as evidenced by the Metropolitan Reading Readiness. In addition the lack of positive gains on M-S-P retest performance may also reveal indications of a learning problem, as measured by the Pintner-Cunningham Test.

The third hypothesis can therefore be expressed in the following terms:

> That pupils from the experimental and control classes having potential learning problems can be identified by their performance and functioning on the M-S-P testing and retesting.
>
> That pupils 'inabilities so identified will be further confirmed by results of the Metropolitan Reading Readiness Test, Pintner-Cunningham Test and the teacher ratings.

Objective #4

The fourth objective was to set up a working model of prediction procedures that would lead to the early awareness of pupils requiring specialized programing. The purpose being to determine optimal prediction indicies relative to the pupils that were unable to make reasonable progress. Pupils who remain throughout the school year having made significantly less progress are of particular interest. They may indicate eligibility for special education programs, either educable mentally retarded or educationally handicapped.

Moreover, it is important to explore what was perceived by the teacher within the first few weeks of school that foretold learning and achievement difficulties. The teacher's subjective judgement would be weighed in light of the Metropolitan Reading Readiness test, the Pintner-Cunningham ability test and the M-S-P test score.

In other words, the question asked was, "What characteristics are initially evident to the teachers when a pupil has demonstrated little or no progress during the kindergarten year?"

The fourth hypothesis conveying this objective can be stated as follows:

> That pupil characteristics rated by teachers on the basis of observations made during the first few weeks of school will be significantly accurate predictors of yearly overall progress.

III RELATED RESEARCH

The review of the literature that accompanied the proposal for the present study provided the framework from which it was designed. Certain reported references remain relevent to the immediate research and are here briefly summaried. These studies have suggested that early training can be beneficial and that diverse types of training such as motor development are associated with school achievement and ability. For example:

1. Fowler (1962) had suggested that the extent of early childhood achievement may not be fully appreciated or recognized for its possible potential in the cognitive areas we well as other areas.
2. According to Weikart (1963), pre-school training in the areas of perceptual, motor language, visual and auditory activities resulted in significant Stanford-Binet I.Q. gains over a control group.
3. Kirk (1958) reported positive results for an experimental group of moderately retarded children using a pre-school educational program.
4. Ismail, Kephart and Cornell (1963) related motor performance items, such as hopping, jumping, balancing, running, throwing and strength to both I.Q's and achievement scores. The magnitude of correlations ranged from 69 to 86 for fifth and sixth grade boys and girls.

Since his publication of the Slow Learner in the Classroom, Kephart (1960) has contined to stress the importance of a perceptual-motor orientation as the foundation for symbolic and conceptual learning. Two recent articles, one by Kephart (1964) and one by Dunsing and Kephart (1965), have emphasized understanding the injured or disabled learner from the standpoint of motor awareness and motor generalization.

Kephart, as well as others, take the position that when the child of six has not acquired a stable perceptual-motor world he comes to the school tasks handicapped. The specific areas of motor development that Kephart and Dunsing suggests as most relevent to education are:

1. Balance and posture maintenance
2. Locomotion
3. Contact
4. Receipt and propulsion

Each area is described as underlying and contributing to the development of effectively processing perceptual information and subsequently processing symbolic information. It becomes a process of being able to accurately match the perceptual and symbolic information with the already established motor awareness, both objectively and subjectively.

The importance to education lies in the concept of basic readiness for academic learning. Dunsing and Kephart (1965), are encouraging a broader base of diagnosing and evaluating the pupils learning propensities by their emphasis upon the early sensory-motor and perceptual development.

Roach and Kephart (1966) in their Perceptual-Motor Survey Manual point out further support for the relationship between motor development and learning. They refer to Penfields (1959) statement that every central gyrus (sensory) is accompanied by an activity on the pre-central gyrus (motor). This means that for every stimulus going to the cerebral cortex, a concomitant activation is noted in the motor area.

In many respects Barsch (1965) expresses a similar viewpoint relative to "Movigenic" theory and curriculum. This physiologic approach, "regards the child as a sensory-perceptual-motor organism confronted by a variety of energy forms which somehow must be converted into meaningful systems of information if he is to achieve full efficiency as a learner". A regular curriculum, according to Barsch, presupposes two invalid assumptions:

1. That children of average intelligence have become sufficiently successful at processing information by the time they reach six years of age and that such efficiency can be brought to bear upon academic achievement.
2. That the typical child-rearing pattern will have provided a sequence of experiences which may serve as a foundation for academic advancement. Given a child from a reasonable intact family, both assumptions are believed to apply when he enters the first grade. However, many children by virtue of variation in experience, differring opportunities, parental emphasis and a variety of minor forms of developmental failures arrive at the school age "unqualified by lack of adequate basic training" to cope with the demands of the curriculum. This would include six year old children whose auditory and visual systems are intact but yet not efficient listeners, nor visualizers. Moreover tactile, mobility and kinesthetic systems may be physiologically adequate and still children have not learned to appreciate textures, or move and transport themselves with ease and integration. This in essence was the rationale for twelve dimensions of a movigenic curriculum which were utilized by Barsch and labeled as follows:

   a. Muscular Strength
   b. Dynamic Balance
   c. Spatial Awareness
   d. Bodily Awareness
   e. Visual Dynamics
   f. Auditory Dynamics
   g. Kinesthesia
   h. Tactual Dynamics

i. Bilaterality
j. Rhythm
k. Flexibility
l. Motor Planning

Evaluation for twelve children in what appeared to be a demonstration and developmental program found the most significant improvement in Dynamic Balance, Kinesthesia, Rhythmic Movement, Bilaterality, Flexibility, and Motor Planning. Less dramatic gains were noted in the other areas.

In addition six pupils with special learning disabilities were given a program that included ten of the twelve dimensions. Future plans were described for seventy pupils evidencing special learning problems. The major objective was first to establishing a movigenic curriculum model and statistical analysis was not utilized.

Another indication of how important sensory-motor systems are to the development, maintenance and adaption of spatial orientation even in adults, has been investigated by Held (1965). Pursuant to the reported work on sensory deprivation, he postulates a single mechanism to account for all three conditions of sensory-motor control. (i.e. development in the young, maintenance over a long period of growth, and adaptions to environmental or external changes of input information).

The single mechanism to which he refers is called "reafference". A word coined to describe neural excitation following sensory stimulation that is systematically dependent on movements initiated by the sensing animal. Held was successful in demonstrating that the lack of initiated movement on the part of animals and adults in altered external conditions hampered the effective processing of sensory data (visual and auditory) in making adjustments to rearranged conditions.

In essence the conclusion he drew was: that the correlation entailed in the sensory feedback accompanying movement-re-afference plays a vital role in perceptual adaption. It helps the newborn to develop motor coordination; it figures in the adjustment to the changed relation between afferent and efferent signals resulting from growth, it operates in the maintenance of normal coordination, and it is of major importance in coping with altered visual and auditory inputs.

The support for the conclusion was demonstrated in a series of ingenius experiments that deprived subjects of movement feedback related to other sensory stimulation. For instances both kittens and men transported within a large drum, in contrast to such subjects moving on their own within the drum produced different perceptual impressions of various standard visual stimuli.

The concept of "reafference" applied to school age children would if generalized suggest the manner in which pupils with motor and sensory handicaps develop a typical coordination and perceptual feedback systems. This in turn may be associated with the assumption favored by some educators that variant perceptual motor performance of pupils is somehow related to variant central nervous system organization.

The topic of intersensory performance was investigated by Birch and Lefford (1963). They sought to determine the intersensory equivalances of visual, kinesthetic and haptic (tactile) discrimination for eight geometric forms. A stimulus form was presented for one modality and the subject attempted to match the form via another modality. The intersensory performance was most efficient for visual to haptic judgments and markedly less for visual to kinesthetic and haptic to kinesthetic. They found that the ability to make various intersensory judgements clearly improved with age. The sample included 145 subjects ranging in age from 5 to 11 years.

The visual to haptic judgments were essentially without error by the age of eight, and about 65% of the cases made only two or less errors at the age five. Under the conditions of the experiment it was found that for some subjects the integration of visual to haptic was sufficiently developed at school entrance age to give near perfect accuracy. The implication being that better liaison between the sensory modalities is the expected developmental pattern. Also that the interdependence of sensory functions underlies the development of motor control, perception and cognition.

At a less theoretical level significant work related to the concept of school readiness has been reported by Ilg and Ames (1964). Normative data has been made available by their descriptive percentages of pupil performances at various age levels. The detailed accounting of test responses by four and five year old children is helpful in recognizing expectancies for certain visual, graphic and laterality tasks. Interest in kindergarten grouping, according to this type of readiness evaluation is currently receiving considerable attention and study.

A test designed to screen out those children who will not make sufficient progress in the first grade has been reported by Pate and Webb (1965).

Test items sample three areas of functioning: intellectual, emotional and neurological. Pilot studies and revisions preceded the initial standardization with 1700 subjects. The authors report that nationwide standardization is currently in process and that:

> the total score identified three out of four of the children who were "not ready for second grade work, while only one out of ten were misidentified".

This problem screening test is an untimed, pencil and paper, teacher administered test and may be an effective screening devise.

A study by deHirsch, Jansky and Langford (1965) was reviewed by Bateman (1966) as an outstanding effort in developing tests predictive of learning problems.

Their study dealt with a prognostic test battery to identify kindergarten children who were high risks for later failure in reading, spelling and writing. The battery included mobility, gross and fine motor skills, laterality, body image, visual perceptual and auditory perceptual patterning, reading readiness as well as other tests of ego strength and work attitude.

Follow-up evaluation of achievement was made at the end of the second grade on 53 subjects. Of particular interest was the composite predictive index derived from the second grade testing that identified the high risk children. The index was composed of the following ten tests:

1. Pencil use
2. Bender-Gestalt test
3. Wepman's auditory discrimination test
4. Number of words
5. Categories
6. Horst Reversals test
7. Word matching
8. Word recognition 1
9. Word recognition 2
10. Word reproduction

These tests identified ten of the eleven disabled readers or spellers in the project but also singled out two children who were adequate readers or spellers and two who were superior. Small transition classes from kindergarten to first grade were advocated for those children predicted to be high risks.

It was further reported that modality preference between the auditory and visual channels did not appear to be related to school achievement.

A very recent study by Painter (1966) sought to determine the effect of various rhythmic, sensory and motor activities on certain performances of kindergarten pupils. She hypothesized that improvement would occur in human figure drawings, visual motor integrity, sensory motor skills and psycholinguistic abilities.

The training activities utilised were suggested by Kephart (1960) and Barsch (1963) and included the following:

1. Visual
2. Auditory
3. Balance
4. Spatial-body
5. Tactual
6. Body awareness
7. Rhythmic movements
8. Flexibility-tempo changes
9. Unilateral and bilateral movements

Significant results in the hypothesized direction were reported for ten experimental kindergarten pupils over ten control pupils, matched in I.Q., C.A., M.A., and sex. In view of the limited sample and training time the investigator suggested that her work be considered as a pilot study.

IV PROCEDURE - SETTING AND SAMPLE

The kindergarten pupils in this study resided in a rapidly changing suburban area of the Rowland School District. The district covers 26 square miles and currently contains 18 schools, with attendance in excess of 11,000. It is located in a previously agricultural and ranching area of Los Angeles County. The transition is primarily to a residential and industrial community. The present social-economic status range from $10,000 to $40,000, based on residential property values. The homes of kindergarten pupils varied accordingly with differences in nutrition, medical attention, dress, play materials and emphasis on educational involvement.

The initial population was comprised of pupils in attendance at 14 kindergarten classes and totaled 412 as of October 1965. There were 199 boys and 213 girls, whose mean chronological age was 5 years and 3 months. The subjects were from the morning classes only and were experimental or control depending on where the principal had assigned them prior to the commencement of the project. The control as experimental designation was made on the basis of having both classes coming from the identical neighborhood. Schools were selected where two separate classes existed so that approximately equal numbers of experimental and control pupils represented the various types of neighborhoods throughout the district. This condition dictated the choice of the seven schools. Which of the two classes, the experimental or control became the decision of the teachers involved after group discussion on the nature of the project. Several teachers were new and unknown to the investigator, consequently there was little basis for matching. There was perhaps some inherent bias toward experimental teachers in that they were willing to undertake considerable innovation within their daily program. The control teachers were perhaps more reluctant to modify their program and were more inclined to favor a traditional program. The control teachers were further requested to avoid utilizing the training procedures and were not provided with the experimental materials or equipment involved.

PRE-TRAINING MEASUREMENTS

Motor-Sensory-Perceptual Tests

Specific tests were designed in accordance with the concept that primary behavioral response patterns are the foundation upon which educational achievement is built.

Tests for the six response dimensions of motor, kinesthetic, tactile, visual, auditory and graphic were each assessed in relation to mobility, laterality, directionality, spatiality, differentiation and temporality.

The test items are briefly identified in the following chart, however each item is described in the appendix.

M-S-P- TEST ITEMS

	MOTOR	KINESTHETIC	TACTILE	AUDITORY	VISUAL	GRAPHIC
MOBILITY	Angels in the Snow	presision of walking board movement	(masked) Walk a 9' string on floor	Walking in response to clicker stimulus	Walk according to a visual chart	Reproduce on paper demonstrated walking pattern
LATERALITY	Preference for turning entire body	Preference for kicking throwing turning trunk	(masked) hand preference for tactile identification	Preference for placing ear to a sound box	Eye preference for near and far view	Preference of drawing to L or R
DIRECTIONALITY	Walking in the pattern of a square	Demonstrate horizonal, vertical and circular motions	(masked) Locate where on body touched	(masked) Identify direction of sound source	Visual pursuit circular, vertical, horizonal and diagonal	Reproduce on paper figures from chart models
SPATIALITY	Crawling thru two wickets (16" X 16")	Balance on a stick - identify size from 15' distance	(masked) Identify by feel various objects	(masked) Localization a specific place of sound	Estimate distances	Reproduce X's from model according to space allocations
DIFFERENTIATION	Demonstrate dancing skating flying	Demonstrate movements of bouncing, throwing, catching, bending, kneeling & walking	(masked) Discriminate textures	Identify same and different pair of words	Identify and match size of symbols	Produce circles in a gradually increasing size.
TEMPORALITY	Jumping standardize rope movement	Reproducing a sequence of clapping and stomping	(masked) Reproduce tactile pattern	(masked) Reproduce 3 series of alternating bell	Reproduce sequence of light patterns	Ten second production of circles

Teacher's Evaluation Form

The teachers from the fourteen classes rated each pupil on a fifty-two item evaluation form prior to October, 1965. The teachers ratings surveyed general intellectual ability, developmental maturation and classroom achievement. This form is also included in the appendix. (C)

Standardized Group Tests

The Metropolitan Readiness Tests, Form R was administered to pupils of the fourteen classes during the month of October, 1965. Also the Pintner-Cunningham Primary Test, Form A was administered to the same group during the month of October, 1965.

Training Activities

Commencing in November, 1965 the activities were initiated on a six week schedule that was repeated four times.

A brief identification of the training activities are shown in the following chart:

TRAINING ACTIVITIES

	1st Week MOTOR	2nd Week KINESTHETIC	3rd Week TACTILE	4th Week AUDITORY	5th Week VISUAL	6th Week GRAPHIC
MOBILITY (Monday)	-Cross pattern walking -Duck walk -Crab walk -Measuring worm	-Hopping patterns -Walking board variations	(masked) -Inclining walking board -Rope mazes -Spiral pathway	(masked) -Marching to bell, clicker and whistle -Follow leader by listening -Respond to sounds	-Transposing visual patterns in movement 0 7 8 □ △ ◇	-Draw a walking pattern -Reproduce an air drawing
DIRECTIONALITY (Tuesday)	-Horizonal ladder -Tire hopping -Turning bar -Table crawl -Balloon circle -Twirling	-Throw, catch bounce, kick ball in pairs	(masked) -Circle string game -Tactile transmission -Finger mazes -Dressing in dark	(masked) -Localization of direction stationary and moving sounds	-Eye pursuit activities (near and far point) -Eye push ups -Cross-over body imitation responses	-Drawing from model charts -Line and dot, tracing -Template drawing
SPATIALITY (Wednesday)	-Obstacle course -Poison River -Free form stepping stones -Sacking chairs -Board crawl	-Balancing toes, heels -Wall fall -Square hopping -Balance boards	(masked) -Assembling parts -Peg boards -String beads -Clip on Ma -Washers on stick	(masked) -Identifying place in series of sounds, 1st, last, middle	-Finding shortest way, longest way -Matching shapes and size	-Body drawings full scale tracing, small scale drawing - Complete drawing, draw missing part -Draw object arrangements
DIFFERENTIATION (Thursday)	-Follow leader skip, hop, march, jump, walking -Pretend movements--dance, skate, swim	-Imitation of body movements -Body parts identification	(masked) -Person identification -Grab bag -Matching items -Duplicate bead pattern	(masked) -Identification of numerous differend sounds -Likenesses and differences of paired sounds	-Object sorting -Symbol sorting -Cut, paste and match	-Omission drawing -Make set all different
TEMPORALITY (Friday)	-Jump rope -Freeze -Musical chairs	-Clapping and stomping to drum beat	(masked) -Reproduce domino pattern -Grab the feather -Knotted rope -Catch snow flakes	(masked) -Repeating rhythm patterns -Selective responding -Auditory transmission	-Group number assembly -Object arranging -Pattern matching	-Draw in a reducing size sequence -Complete a pattern -Reproduce a sequence of symbols -Draw pattern from dictation

The description of each activity is provided in more detail in the appendix. The section on laterality was not incorporated in the training program. It was not possible to do the type of individual analysis and perscriptive training necessary to adequately provide for individual needs in this area. However data on laterality performances were maintained for analysis to compare pre and post training results.

The schedules for training were assigned throughout the seven experimental classes so that approximately 120 pupils (4 classes) received a minimum of 100 minutes per week in each of the six area. This schedule can be illustrated as follows:

CLASS	AREAS					
	MOTOR 1st Wk.	KINES. 2nd Wk.	TACTILE 3rd Wk.	AUDITORY 4th Wk.	VISUAL 5th Wk.	GRAPHIC 6th Wk.
A	X					
B		X	X			
C				X	X	X
D	X		X	X		
E	X	X			X	X
F		X	X	X	X	X
G	X	X	X	X	X	X
	4	4	4	4	4	4

The six week schedule was repeated four times during the school year, until May 1966.

Post-Training Measurements

A replication of the four pre-training measures was made for the entire 14 classes during part of May and June 1966. This testing included (1) M-S-P measures, (2) Teacher Ratings, (3) Metropolitan Readiness Tests, Form S, and (4) Pintner-Cunningham Primary Test, Form B.

Analysis of Data

Acknowledgement is hereby given to Pacific State Hospital, Socio Behavioral Study Center for Mental Retardation, for their assistance in the computer analysis of the data.

V RESULTS AND FINDINGS

The data were initially analyzed in reference to the four hypotheses. The results are presented in the order of the hypotheses.

Hypothesis #1

The first hypothesis related to the question of differential measurement of the M-S-P scores on both coordinates of the matrix. The two sets of scores were evaluated separately in respect to the nature of their inter-relationship.

Sub-Hypotheses #1-A

The first set of scores were the motor, kinesthetic, tactile, auditory, visual and graphic dimensions. In answer to the question of whether such scores differentiated the various types of behavior responses, the following table (1) presents the product moment correlations for the six areas, using pre-training scores only.

TABLE 1.

Product-Moment - Intercorrelations among the Six Response Systems
n= (number in brackets) - Pre-training scores only

	M 1.	K 2.	T 3.	A 4.	V 5.	G 6.
1. Motor		.58 (86)	.42 (82)	.42 (82)	.40 (85)	.33 (85)
2. Kinesthetic			.48 (138)	.40 (94)	.32 (139)	.51 (139)
3. Tactile				.50 (136)	.51 (94)	.41 (94)
4. Auditory					.46 (242)	.49 (142)
5. Visual						.48 (287)
6. Graphic						

These correlations ranging from .33 to .58 are significant from the standpoint of zero correlation. It is reasonable to expect some association among these areas, however, the degree of relationship is the important question.

The extent of association was further revealed by the computation of Kendall's Coefficient of Concordance: W. (Siegel 1956). This statistic provided a view of the overall correlation among the six variables. The correlation was .29 which suggested considerable specificity for the motor, kinesthetic, tactile, auditory, visual and graphic performances. This analysis was made on the pre-training scores for fifty-two pupils who were measured and ranked in all six areas.

To view the data still another way, Friedman's Two-Way Analysis of Variance, (Siegel 1956) was used to assess the independence of the six variables. For the same 52 pupils, a χ_r^2 of 9.62 was obtained which falls between the .10 and .05 significance level, for five degrees of freedom.

These three analyses do not completely support the contention of the first sub-hypothesis. However it is clear that considerable variance has not been accounted for among this set of dimensions. The effective prediction of performance from one to the other would not be possible. Moreover, the intercorrelations are not sufficient to suggest that any dimensions should be omitted in assessing pupils performance.

Sub-Hypothesis 1-B

The second set of scores were measures related to the more general functioning of the pupil. For example: the dimension of mobility was assessed in respect to motor, kinesthetic, tactile, auditory, visual and graphic tasks. Similarily, the dimensions of laterality, directionality, spatiality, differentiation and temporality were also assessed in each task areas. For a complete description of each measure see Appendix A.

In a similar manner as reported above, the intercorrelations among these six dimensions portray the degree of association. The correlations shown in the following table (2) range from .02 to .49.

In addition, the Kendall Coefficient of Concordance: W was again computed and found to be .27. Also the Friedman Two-Way Analysis of Variance for these six dimensions was 75.17, which is significant beyond the .001 level for five degrees of freedom.

TABLE 2.

Product Moment Intercorrelations among the Six Areas of General Functioning
Pre-Training Scores Only n=40

	M 1	L 2	Dir 3	S 4	Dif 5	T 6
1. Mobility		.02	.30	.08	.44	.49
2. Laterality			.10	.13	.03	.15
3. Directionality				.26	.30	.23
4. Spatiality					.08	.27
5. Differentiation						.46
6. Temporality						

In comparison between the first and second sub-hypothesis, the results are somewhat similar, except that in the latter case, the intercorrelations are generally lower and the differentiation more pronounced. From the standpoint of measurement specificity the dimensions of *mobility*, *laterality*, *directionality*, *spatiality*, *differentiation* and *temporality* are more likely to be diagnostically revealing.

In summary it has been shown that several dimensions are independent and non-replicated measures.

How the pupil's performance on the various tasks was related to the presence or absence of specific training is the question of the next hypothesis.

Hypothesis #2

This hypothesis stated that significant gains would be made in favor of the experimental pupils during the pre-to post-testing period. The test - retest results are organized and presented in several categories of comparison:

1. All experimental pupils versus all control pupils for pre- and post-testing - Table 3.
2. All boys versus all girls on pre- and post-testing - Table 4.
3. Experimental boys versus control boys on pre- and post-testing and experimental girls versus control girls on pre- and post-testing - Table 5.

The most comprehensive comparative analysis (1) is shown in table 3. This table reports the differences that existed before and after training. From these data it can be seen that both experimental and control pupils made substantial mean gains in all dimensions.

The two dimensions that were significantly different at .05 level or less were motor, and graphic. However, graphic significantly favored the experimental group before training. At this level of comparison only the increased motor performance could be attributable to the training activities. The General fact, however, that the control group also made substantial mean gains in motor as well as other dimensions, supports the effectiveness of the traditional kindergarten experiences and indicates it's relevance to motor-sensory-perceptual dimensions. This is apparent at least when total groups are compared.

Table 4 presents the comparative analysis (2) between boys and girls on pre- and post-test results. This analysis primarily demonstrates that no significant differences existed between the sexes prior to training. Despite the potential equalizing effect of combining the experimental and control groups a significant difference is shown following the training in favor of the boys for the tactile dimension. Boys generally were slightly better to begin with and maintained a more consistent gain for the year with and without training. The singularity of this finding does not constitute an endorsement against the usual superiority of girls but is a welcomed variance. This was a series of tasks requiring masking and may relate to the more advantageous experiential background of boys.

When the experimental versus control breakdown is made (3) as shown in table 5, the girls appear to have profited most from the training. The boys failed to demonstrate any significant differences between experimental and control for either pre- or

TABLE 3

Results of
M-S-P Test - Pre-training - Retest - Post-training - Experimental - Control

M-S-P Dimension	Pre-training N	Pre-training Mean Experimental	Pre-training N	Pre-training Mean Control	Pre-training t-ratio	Post-training N	Post-training Mean Experimental	Post-training N	Post-training Mean Control	Post-training t-ratio
Motor	80	40.2	88	38.9	1.109	82	46.5	96	44.9	2.200 #
Kinesthetic	90	41.8	94	40.7	1.113	93	44.5	101	45.8	-1.809
Tactile	86	40.4	94	39.1	1.196	87	44.5	98	44.4	.220
Auditory	91	38.8	93	38.1	.324	92	42.6	97	43.0	- .436
Visual	95	38.8	92	38.1	.619	97	45.5	100	44.1	1.600
Graphic	95	40.1	92	36.6	3.163 #	97	44.9	100	43.1	2.677 #

- Significant beyond .05 level

TABLE 4

Results of M-S-P

Test - Pre-training - Retest - Post-training - Boys versus Girls

M-S-P Dimensions	Pre-training							Post-training						
	Boys			Girls				Boys			Girls			
	N	M	SD	N	M	SD	t-ratio	N	M	SD	N	M	SD	t-ratio
Motor	72	39.8	7.5	97	39.3	8.4	.380	78	45.5	5.7	100	45.7	4.5	- .257
Kinesthetic	86	41.4	6.2	98	41.1	7.6	.230	94	45.5	4.9	100	44.9	4.7	.824
Tactile	92	40.5	5.7	88	38.9	8.4	1.432	95	45.1	4.4	90	43.7	4.7	$\boxed{2.047}$[a]
Auditory	93	38.4	7.5	91	38.3	9.2	.045	96	42.8	6.0	93	42.8	6.0	.020
Visual	87	39.1	6.5	100	38.0	7.8	1.104	95	44.5	6.2	102	45.0	5.8	- .573
Graphic	87	37.5	6.6	100	39.4	7.8	-1.769	95	43.9	4.9	102	44.0	5.1	- .202

TABLE 5

Results of M-S-P
Test - Pre-training - Retest - Post-training
Experimental versus Control Boys and Experimental versus Control Girls

M-S-P Dimensions	Boys									
	Pre-training					Post-training				
	Experimental		Control		t ratio	Experimental		Control		t ratio
	N	M	N	M		N	M	N	M	
Motor	33	39.6	38	39.9	- .190	33	45.9	45	45.2	.534
Kinesthetic	42	41.4	44	41.4	- .005	44	44.6	50	46.2	-1.591
Tactile	45	40.8	46	40.1	.623	46	45.0	49	45.2	- .200
Auditory	50	38.2	43	38.7	- .305	49	42.1	47	43.4	-1.064
Visual	46	38.3	41	40.1	-1.294	47	44.8	48	44.3	.371
Graphic	46	38.6	41	36.3	1.626	47	44.7	48	43.1	1.605

M-S-P Dimensions	Girls									
	Pre-training					Post-training				
	Experimental		Control		t ratio	Experimental		Control		t ratio
	N	M	N	M		N	M	N	M	
Motor	47	40.7	50	38.1	1.57	49	46.9	51	44.6	$\boxed{2.710}$
Kinesthetic	48	42.3	50	40.1	1.43	49	44.5	51	45.3	- .948
Tactile	40	39.9	46	38.2	.97	41	44.0	49	43.6	.419
Auditory	41	38.0	50	37.8	.69	43	43.1	50	42.5	.454
Visual	49	39.3	51	36.6	1.75	50	46.1	52	44.0	1.945
Graphic	49	41.6	51	37.2	$\boxed{2.94}$	50	45.1	52	43.0	$\boxed{2.165}$

post-testing. Girls on the other hand showed a highly significant difference for the post-test *motor* dimension not present in the pre-testing. The significant difference shown for the *graphic* dimension between experimental and control girls was present prior to training and remained so thereafter.

In general the second hypothesis received very limited support from the M-S-P testing. The exception was *motor* gains for the girls. The hypothesized efficacy for the training activities was not evidenced in respect to M-S-P dimensions.

Additional measurements that pertain to areas other than M-S-P dimensions for the experimental versus control populations are reported in the following order:

(4) Teacher ratings - Table 6

(5) Pintner-Cunningham Primary Test - Table 7

(6) Metropolitan Readiness Test - Table 8

Table 6 provides the results of the evaluations made by the experimental and control teachers for pre- and post-training periods. The actual items used for this rating inventory are given in appendix C. This form was designed to assess behavior that is of general concern to kindergarten teachers. Typically their attention is focused on personal and social adjustment, intellectual competencies and physical or health aspects. For the purposes of comparative analysis table 6 lists only the 41 positively stated items to avoid contamination of reversed scoring.

All but two of the ratings favor the experimental group on pre-training scores. Of these 39 items 22 were significant at the .05 level of confidence, at least this preponderance of favorable ratings at the pre-training stage for experimental pupil would suggest the presence of a prejudicial effect on the part of the experimental teachers. However, the ten items that are underlined denote those which were not significant on pre-training evaluation but were significant on post-training evaluation, favoring the experimental over the control group. The ten items are as follows:

2. Does he have self-control in the classroom?

4. Is he willing to help others?

6. Does he have ability to adjust to new situations?

16. Is he good at games?

17. Does he have good coordination?

27. Does he remember stories?

TABLE 6

Teacher's Pre- Post Ratings - Experimental Versus Control

	Pre-training					Post-training				
	Experimental (N=161)		Control (N=174)		t	Experimental (N=161)		Control (N=174)		t
Item	M	SD	M	SD	ratio	M	SD	M	SD	ratio
1.	5.7	2.0	5.2	2.0	2.36	6.4	2.3	6.0	2.3	1.90
2.	6.0	2.0	5.8	2.0	.97 #	7.0	2.0	6.5	2.3	2.17 #
3.	6.5	2.0	6.0	1.9	2.21	7.3	1.9	6.8	2.2	2.06
4.	6.2	1.7	5.8	1.8	1.81 #	7.1	1.8	6.4	1.8	3.62 #
5.	6.4	1.7	5.9	1.8	2.66	7.3	1.7	6.7	1.7	3.39
6.	5.9	1.9	5.6	1.9	1.51 #	7.2	1.8	6.6	1.8	2.76 #
7.	6.4	2.0	5.5	2.1	4.41	7.1	1.9	6.5	2.0	2.35
8.	6.2	1.9	5.4	2.0	3.81	6.9	2.1	6.2	2.0	3.30
9.	6.1	1.8	5.6	1.9	2.63	7.4	1.9	6.5	1.8	4.30
10.	6.3	1.6	5.8	1.7	3.15	7.4	1.7	7.2	1.6	1.39
11.	6.6	1.7	5.9	1.8	3.39	7.2	1.9	7.0	1.9	1.01
12.	6.5	1.7	5.8	1.8	3.35	7.1	2.2	6.7	2.2	1.79
13.	6.0	1.8	5.6	2.0	2.12	6.8	2.3	6.4	2.3	1.54
14.	6.1	2.0	5.6	1.9	2.21	7.4	2.0	6.4	2.3	4.30
15.	5.8	1.2	5.7	1.7	.29 #	6.9	1.8	6.9	1.7	- .24
16.	5.7	1.5	5.5	1.9	1.19 #	7.1	1.8	6.4	1.8	3.56 #
17.	5.8	1.6	5.7	1.9	.48 #	7.1	1.9	6.5	1.9	2.99 #
18.	5.9	1.5	5.2	1.8	3.74	7.5	1.6	6.5	1.9	5.08
19.	5.5	1.4	5.4	1.6	.89 #	7.1	1.8	6.7	1.8	1.75
20.	6.2	1.6	6.3	1.8	- .12 #	7.3	2.0	7.0	1.8	1.05
21.	6.0	1.5	5.8	1.9	1.19 #	6.9	2.1	6.7	1.9	.85
22.	6.0	2.0	5.9	7.2	.52 #	7.1	2.1	6.7	2.1	1.77
23.	6.1	2.0	5.7	2.0	2.23	7.1	1.9	6.4	2.0	3.26
24.	6.5	1.8	5.9	1.6	3.14	7.4	1.8	6.9	2.0	2.38
25.	6.0	1.7	5.8	1.9	.81 #	7.1	1.9	7.3	1.6	- .36
26.	6.7	1.7	6.1	1.8	3.42	8.0	1.4	7.1	1.6	5.48
27.	5.9	1.5	5.8	1.9	.58 #	7.4	1.6	7.1	1.7	2.07 #
28.	6.3	2.0	5.9	1.8	1.78 #	7.1	2.2	6.9	1.8	.57
29.	5.5	1.5	5.4	1.8	.58 #	7.0	1.8	6.4	1.9	3.04 #
30.	6.4	1.6	5.8	1.8	3.20	7.5	1.6	6.8	1.7	3.77
31.	5.9	1.9	5.4	2.1	2.28	6.9	2.1	6.0	2.3	3.73
32.	5.4	1.9	5.1	2.1	1.71 #	6.8	2.2	6.0	1.9	3.56 #
33.	7.0	1.8	6.0	1.7	5.34	8.0	1.5	7.6	1.5	1.96
34.	6.5	1.9	5.9	1.8	3.12	7.8	1.5	7.4	1.6	2.32
35.	5.7	1.8	5.4	1.9	1.28 #	7.3	1.8	7.4	1.5	- .52
36.	6.4	1.6	5.9	1.7	2.87	7.7	1.6	7.4	1.5	1.97
37.	5.9	1.4	5.7	1.7	1.19 #	7.6	1.7	7.4	1.5	.06
38.	6.0	1.5	6.3	1.8	-2.14 #	7.4	1.8	7.4	1.6	- .04
39.	6.3	1.6	5.8	1.8	3.01	7.5	1.6	7.0	1.6	2.66
40.	6.2	1.6	6.1	1.8	.25 #	7.4	1.6	6.9	1.5	2.90 #
41.	5.8	1.5	5.5	1.7	1.59 #	6.7	1.7	6.2	1.6	2.70 #

29. Does he understand the differences in time (long periods versus short periods)?

32. Does he share and demonstrate well before the class?

40. Does he enjoy music?

41. Does he have rhythm?

It is important to recognize that four items, (16, 17, 29, 41) were specifically related to the training activities.

As far as teacher's ratings are concerned they initially favored the experimental pupils with 21 significant, at least at the .05 level, as opposed to one significant item favoring the control group. The post-training evaluations were even more favorable to the experimental group, with 26 items significant and none favoring the control group. It could be argued that these results are perhaps more a reflection of a difference in teacher's perception and attitude than changes in pupils. However, before accepting this interpretation the following results need to be viewed, in that they are measures independent of teacher's particular views.

Table 7 provides a comparison of pre- and post-training results for the experimental and control groups on the Pintner Cunningham Test. There was no significant difference between experimental and control groups on pre-training measures. However there was a highly significant difference favoring the experimental group on the post-training scores for test number six. This test requires the pupil to visually discriminate and match the missing parts of familiar objects. This was a pronounced change and may well have related to the numerous visual training activities that were provided throughout the year. To this extent the experimental pupils were able to demonstrate the acquisition of a meaningful educational skill. The next section makes a similar comparison in relation to achievement readiness.

Table 8 gives the pre- and post-training test results on the Metropolitan Readiness Test for the experimental versus control groups. No significant differences were present prior to the training period. However, the post-training results revealed one significant difference which favored the experimental group. Test number four of the Metropolitan has to do with matching symbols, which again is primarily a visual task.

In respect to both the Pintner and Metropolitan Tests it would seem reasonable to expect that some added impetus can be given to kindergarten pupils in the task of visually processing symbolic information through training activities.

TABLE 7

Pintner-Cunningham Primary Test - Pre- Post Training Results For Experimental Versus Control Groups

Tests	Pre-training							Post-training						
	Experimental			Control				Experimental			Control			
	N	M	SD	N	M	SD	t-ratio	N	M	SD	N	M	SD	t-ratio
1.	160	4.54	2.04	172	4.31	2.05	1.047	158	5.94	1.53	173	5.94	1.62	- .032
2.	161	4.78	1.42	174	4.56	1.60	1.331	161	5.36	1.12	174	5.33	1.20	.257
3.	161	2.73	2.05	174	2.59	1.89	.679	161	4.44	1.82	174	4.20	1.81	1.211
4.	161	2.32	1.37	174	2.21	1.40	.690	161	2.16	1.50	174	1.93	1.48	1.414
5.	160	3.34	3.05	172	3.33	3.19	.020	158	6.75	3.84	173	7.05	3.77	- .709
6.	161	2.32	1.97	174	2.39	1.76	.609	159	9.84	1.59	173	4.82	2.33	3.941 #
7.	161	1.02	1.39	174	.83	1.19	1.351	161	2.24	1.96	174	1.95	1.95	1.375
Total	159	21.52	9.99	172	20.61	9.26	.859	158	32.64	10.16	173	31.48	10.78	1.007

TABLE 8

Metropolitan Readiness Test - Pre- Post-training Results
For Experimental Versus Control Groups

Tests	Pre-training					Post-training				
	Experimental N=160		Control N=171			Experimental N=158		Control N=172		
	M	SD	M	SD	t-ratio	M	SD	M	SD	t-ratio
1.	12.81	3.27	12.18	3.79	1.640	14.83	2.12	14.62	2.61	.802
2.	7.25	2.70	6.77	3.00	1.526	10.38	[illegible]	11.43	4.65	-1.846
3.	8.96	3.50	8.45	3.50	1.430	11.25	2.47	11.57	2.62	- .537
4.	6.46	3.26	5.71	4.95	1.332	12.13	4.35	11.01	4.94	2.376 #
5.	5.83	[illegible]	5.05	4.37	1.682	12.48	4.92	12.45	3.08	- .057
6.	1.38	2.06	1.38	1.97	- .023	3.29	2.17	3.70	3.04	1.739
2-4	35.48	12.18	33.72	13.25	1.491	[illegible]	9.49	48.61	10.94	.959
[illegible]	5.33	4.27	5.05	4.21	1.632	12.40	4.92	12.45	3.08	- .093
Total	42.59	16.93	39.54	17.91	1.942	67.23	15.92	65.96	17.12	.886

Hypothesis #3

It was hypothesized that:

> pupils from the experimental and control classes that have potential learning problems can be identified by their performance on the M-S-P tests and retests. That pupils inabilities so identified will be further confirmed by results of the Metropolitan Reading Readiness Test, Pintner-Cunningham Test and teacher's rating.

Fourty-five pupils were identified that scored one standard deviation below the total population mean on the post training M-S-P measures. This included pupils who were below to begin with and made essentially no gain from pre to post testing as well as pupils who actually regressed in performance. The M-S-P scores that differentiated this groups are shown in Table (9). From this table it can be seen that the mean of the non-gainers was less at the end of the year.

TABLE 9.

Descriptive Statistics Illustrating Differences Between M-S-P Non-gainers and Gainers

	Non-gainers	Gainers	Total
M-S-P- Tests			
N=	45	162	
Mean			
Pre-test	35.6	40	39.3
Post-test	34.9	45	44.7
Standard Deviation			
Pre-test	8.7	7.0	7.5
Post-test	5.8	4.5	3.3

In order to test this hypothesis, comparisons were made between the gainers and non-gainers on the Pintner and Metropolitan tests. The results shown in tables (10) and (11) are very significant and lend support to the hypothesis. It can be expected that pupils doing poorly on M-S-P tests are likely to do poorly on cognitive and academic readiness measures.

In contrast, the results of the teachers ratings were not significantly different between the non-gainers and gainers. The actual figures are shown in table (12). The teachers may have been aware of individual pupils that were low in specific areas, however, as a group their evaluation did not differentiate the non-gainers. To this extent the hypothesis was not supported.

Therefore, in summary, it can be stated that pupils failing to maintain minimum M-S-P progress whether they received experimental training or not do, in general, score significantly lower on the Pintner and Metropolitan tests. However, it appears that teacher's evaluations in the present form are not as indicative of achievement and learning difficulties. The relationship of the teacher's ratings to the general pupil population is examined in more detail as part of the next hypothesis.

TABLE 10.

Comparison between M-S-P Non-gainers and Gainers on the Pintner-Cunningham Ability Test

Pintner-Cunningham Ability Test	Non-gainers		Gainers
		Pre-training	
n	45		287
Mean	15.3		21.9
SD	7.99		9.56
		T= 4.947 P < .001	
		Post training	
n	45		286
Mean	25.6		33.0
SD	9.49		10.3
		T= 4.650 P < .001	

TABLE 11.

Comparison between M-S-P Non-gainers and Gainers on the Metropolitan Readiness Test

Metropolitan Readiness Test	Non-gainers	Gainers
	Pre-training	
n	45	286
Mean	29.96	42.81
SD	15.99	17.10
	T= 4.967 P <.001	
	Post-training	
n	45	284
Mean	56.82	68.31
SD	17.51	15.82
	T= 4.141 P <.001	

TABLE 12.

Comparison between M-S-P Non-gainers and Gainers on the Teacher Ratings

Teacher Ratings	Non-gainers	Gainers
	Pre-training	
n	45	290
Mean	284	300
SD	51	52
	T= 1.91	
	Post-training	
n	45	290
Mean	335	350
SD	72	66
	T= 1.319	

Hypothesis #4

The remaining hypothesis proposed to determine whether or not there are effective prognostic indicies of pupils progress for the kindergarten year. The fourth hypothesis was stated as follows:

> That pupil characteristics rated by teachers on the basis of observations made during the first few weeks of school will be significantly accurate predictors of yearly overall progress.

It is a reasonable assumption that the teachers ratings are indicative of the pupil's positive adjustment to the teacher and her program. If grades were given they would reflect comparable evaluations.

An overall view of teacher ratings can be gained from table (13). The yearly progress is shown to be positive and significant from the teachers standpoint. It is interesting to note that the ratings for the experimental group gained more, varied greater and correlated less between pre and post measures. In contrast the control teachers were more consistent and less variable, but also indicated a positive growth for their pupils.

TABLE 13.

Teacher Ratings

	Total Sample		Experimental Group		Control Group	
	Pre	Post	Pre	Post	Pre	Post
Mean	298	348	301	353	295	342
S.D.	52	67	46.	71.	57	62
T-ratio		15.36		9.50		12.05
Correlation		.52		.37		.64

Comparison of the correlations between the teachers ratings and other major variables as they existed at pre and post testing periods are shown in table (14).

TABLE 14.

Correlations of Teacher Ratings with other Major Variables Comparing Pre-Testing with Post-Testing for Experimental Versus Control Groups

	Teacher Ratings			
	Pre-testing		Post-testing	
	Experimental	Control	Experimental	Control
Pintner-Cunningham	.58	.15	.29	.22
Metropolitan Readiness	.59	.24	.59	.34
Motor	.32	.12	.07	.05
Kinaesthetic	.49	.40	.19	.19
Tactile	.08	.13	.04	.04
Auditory	.28	.13	.24	.05
Visual	.35	.32	.12	.32
Graphic	.33	.41	.13	.40

If the teachers perception and the pupils performance maintained the same relative position for the year, the correlations for pre and post testing would remain essentially the same. It is clearly evident from table (14) that pupils did change and/or the teachers viewed them differently. The marked drop in the correlations reveal the variations that must have occurred during the year.

The question of concern here is what are the helpful indices that relate to year-end evaluations. Table (15) provides the correlations between pre to post measurements for teacher ratings and academic readiness. It is presumed that how pupils are perceived by their teacher and the acquisition of readiness skills are the major aspects of the educational program. Therefore, inspection of table (15) reveals that:

1. Teacher's views are associated with the kinesthetic, visual and graphic performance to a similar extent.
2. Academic readiness as measured by the Metropolitan has nearly equal association with motor, kinesthetic, tactile, auditory, visual and graphic.

The important difference is that the teachers ratings appeared not to be related to the part motor, tactile and auditory performances play in readiness. This is even more apparent when the teacher evaluates the pupils during the first two weeks of the school year.

Comparison of the correlational patterns for three predictive assessments (i.e. teacher ratings, Metropolitan and Pintner), with M-S-P performance for the year-end are shown in table (16). The relative differences seem further illustrate how teachers ratings neglect the motor, tactile and auditory dimensions. Whereas both the Metropolitan and Pintner provide a more comprehensive assessment.

TABLE 15.

Correlations of Pre-test measures to Post-test results
for Teacher Rating and Metropolitan Readiness Test

Beginning Year Measures	Year-end — Teacher Ratings	Year-end — Metropolitan Readiness
1. Teacher Ratings	.84	.45
2. Pintner	.42	.76
3. Metropolitan	.37	.93
4. Motor	.17	.39
5. Kinesthetic	.40	.49
6. Tactile	.07	.34
7. Auditory	.18	.37
8. Visual	.35	.42
9. Graphic	.43	.48

TABLE 16.

Comparative Correlation Patterns of Teacher Ratings, Metropolitan and Pintner Scores with M-G-P Performance - (n= 175 or more)

	Teacher Ratings	Metropolitan	Pintner
1. Motor	.02	.55	.23
2. Kinesthetic	.26	.34	.20
3. Tactile	.05	.31	.20
4. Auditory	.01	.33	.31
5. Visual	.20	.40	.42
6. Graphic	.35	.51	.47
7. Teacher Ratings		.35	.43
8. Metropolitan	.45		.75
9. Pintner	.56	.79	

In respect to the fourth hypothesis the results do not support the notion that teachers initial ratings could serve as a predictive indicies of the years progress. It is clear that despite the relatively high self correlations from beginning to end of year for teacher ratings, (.84) Metropolitan (.80) and Pintner (.80), the correlations with M-S-P performance are not sufficiently high for prediction purposes.

Moreover, the correlation patterns point out that teacher evaluations are less effective than the Metropolitan or the Pintner in predicting all of the M-S-P performances.

VI. SUMMARY, CONCLUSIONS AND IMPLICATIONS

The public schools have the opportunity of viewing the kindergarten program as diagnostic and developmental in nature. Initial pupil evaluations as part of the instructional program can provide prescriptive and corrective approachs to the instructional process. The purpose of such evaluations should, as Bruner (1966) has pointed out, help translate the curriculum into modalities that would supply the needed mastery of simpler skills in order for the learner to proceed to more complex skills.

With the help of Montessori, Piaget, Vygotsky, Kephart, Hunt, and many others, educators are increasingly recognizing the fundamental role of motor, sensory and perceptual processes in academic achievement. The observable individual differences among kindergarten pupils in these areas, as shown by Ilg and Ames (1965), leave little question about need and importance of implementing specific training related to motor, sensory and perceptual performance. The intent of this project was to investigate the feasibility of providing such a program.

The major objectives were four in number:

1. The primary objective was to evaluate the concept inherent within the M-S-P matrix. It was paramount to determine if objective measures of the pupils performance in respect to motor, kinesthetic, tactile auditory, visual and graphic categories were reasonably specific and independent. It was also proposed that such performance would vary independently when the response behavior involved more generalized functioning, such as, mobility, laterality, spatiality, directionality, differentiation and temporality. To discover the specific nature of pupils needs and strengths in these areas can offer direction and economy to implementing training activities.

2. The second objective was to determine the effectiveness of an experimental training program. Over one hundred specific training activities were developed to correspond with the M-S-P areas. The purpose was to compare, by means of experimental versus control classes, the impact of training activities specially designed to enhance the functioning of pupils' M-S-P performance.

3. The third objective was to identify the pupils that exhibited disabilities and/or a developmental delay revealed by their M-S-P performance. It was anticipated that such pupils

would manifest a discrepancy in achievement potential when contrasted with the remaining population. Confirmation was sought in respect to teacher ratings, Metropolitan Readiness Test scores and Pintner-Cunningham Ability Test scores.

The relevance of early pupils identification can be easily appreciated when viewed from the standpoint of special education and other remedial programs currently available or developing within the public schools.

4. The fourth objective was to explore the predictive potential of the principle measurements resulting from this study. To establish the source of effective prognostic indicies of pupils' yearly progress would assist in curriculum implementation. This is particularly true if insight can be procured during the first two weeks of the school year. Particular attention was focused on on the efficacy of teachers' initial evaluations as predictors.

The procedure can be summarized as follows:

1. The sample originally totaled 412 kindergarten pupils of the Rowland School District. This sample was composed of 197 boys and 213 girls, whose mean chronological age, as of October, 1965, was 5 years and 3 months.

2. Fourteen kindergarten classes were selected in pairs from seven elementary schools. The experimental and control classes were similar in that pupils for both were residents of the immediate attendance area surrounding each of the seven schools. The designation of experimental versus control teachers was based on the teachers preference. Willingness to undertake considerable innovation was essential and may have unavoidably introduced some bias.

3. Four major test instruments were utilized:

   a. The M-S-P test, containing thirty-six subtests, was individually administered at the beginning and end of the school year.

   b. Teachers ratings for all pupils were obtained on a 32 item evaluation form at the beginning and end of school year.

   c. The Metropolitan Readiness Test was administered to all pupils according to standardized procedures by a single examiner. Two separate forms were used for pre- and post-training periods.

d. The Pintner-Cunningham Ability Test was administered at pre- and post-training periods, also using separate forms and the same examiner.

4. The training activities were instituted during November, 1965, and continued until May of 1966. The procedure was to provide the instructions, material and equipment (described in the Appendix) to each experimental class for weekly periods of training in each of six areas (motor, kinesthetic, tactile, auditory, visual, graphic). Training in each area was replicated four times, for a total of twenty-four weeks. Each of the five days of the week were devoted to one of the five types of functioning (mobility, spatiality, directionality, differentiation and temporality). Laterality was assessed but not trained in view of the individual requirements involved in mixed dominant conditions.

5. The data resulting from pre- and post measures were in part analyzed with the assistance of computer facilities at Pacific State Hospital and the Health Sciences Computing Facility at the University of California, Los Angeles. Major computations were made to analyze the relative significance of mean differences and variances. Where applicable, analysis by correlation was computed. A portion of the data were manually analyzed, particularly where non-parametric statistics were appropriate.

The _results_ are reported in respect to the previously stated objectives.

1. The intercorrelations among six dimensions of the M-S-P matrix, including motor, kinesthetic, tactile, auditory, visual and graphic, ranged from a low of .33 to a high of .58. For the minimum N of 82, these correlations are significant from zezero correlations. However, a non-parametric multiple correlation statistic, (Kendall's Coefficient of Concordance: W, Siegel, 1956) reveals an overall intercorrelation of _.29_. Furthermore, Friedman's Two-Way Analysis of Variance (Siegel 1956) assessed the independence of the six variables as $\chi_r^2 = 9.62$. This statistic is significant between the .10 and .05 level.

For the dimensions of mobility, laterality, directionality, spatiality, differentiation and temporality. The range of intercorrelations was from .02 to .4[illegible]. The multiple correlation coefficient [illegible] was .[illegible]3. The analysis of variance was 15.[illegible], which is significant beyond the .001 level.

2. The major results relating to the effect of the experimental training program were:

   a. Differences [illegible] were found to be significantly [illegible] for the experimental pupils. The [illegible] including [illegible] Dimensions did not reveal a significant difference between experimental and control groups.

   b. Girls profited more from the experimental training than boys and this was found to be [illegible]. The comparison of experimental girls, irrespective of [illegible], [illegible] significant [illegible] for [illegible].

   c. Positive and significant changes from pre- to post evaluation for the experimental over the control pupils were obtained from the teacher rating [illegible] showed significant change for the control group.

   d. Subtest number six from the Illinois [illegible] Test revealed a significant positive change from pre- to post-testing for the experimental. No comparable change was noted for the control pupils.

   e. Subtest number four from the Metropolitan Readiness Test similarly showed a positive and significant change for experimental pupils from pre- to post-testing. This did not occur for the control pupils.

3. The results related to identification of pupils that indicated learning disability or developmental lag were:

   a. Forty-five pupils were identified that initially scored below one standard deviation on the [illegible] tests and made no progress or regressed upon [illegible] retesting.

   b. These pupils (termed non-gainers) were significantly different in the anticipated direction from the remaining population on both the Metropolitan and [illegible] tests.

   c. The teacher ratings, however, failed to differentiate between the identified non-gaining pupils and the other pupils.

4. The results pertaining to the predictability of pupils yearly progress were:

   a. Teacher ratings were found to be the least effective predictors of pupils progress.

   b. Teacher ratings were also found to be unrelated to pupils performance in the areas of motor, tactile and auditory.

   c. The pre-training Pintner scores and the post-training M-S-P scores correlated within a range of .20 to .47. These correlations while significant from zero are however, not practical for predictive purposes.

   d. Similar correlations for the pre-Metropolitan and post M-S-P scores, ranged from .31 to .51. This range of correlations is also of minimal predictive value.

The conclusions and implications derived from this investigation are:

1. The specificity or independence among the various dimensions of the M-S-P matrix was in general only partially demonstrated. Laterality and spatiality are the most clearly independent dimensions. The moderate intercorrelations among the remaining dimensions are not sufficiently high to indicate that any should be omitted in pupil assessment. Furthermore, the evidence does not indicate the presents of replicate or global measurements.

   With additional test development and refinement it is likely that evaluations of mobility, laterality, spatiality, directionality, differentiation and temporality would be of greater diagnostic value.

2. With limited exceptions it is apparent that the experimental training program is not significantly effective for kindergarten pupils in general. Experimental pupils did demonstrate positive growth in nearly all measured aspects, however, control pupils frequently made comparable growth.

   From the instances where the training did evidence a significant contribution it is shown that:

   a. girls should be provided with numerous motor activities.

   b. teachers involved in M-S-P training of pupils become significantly more differentiating in their evaluations than teachers not participating in M-S-P training.

c. certain visual discrimination and matching processes appear to have been positively enhanced when pupils participate in this type of training program.

3. When pupils manifest low M-S-P performance and fail to demonstrate improvement upon retesting their readiness for academic achievement is likely to be delayed or handicapped. This was the case whether the particular pupils had been in the training program or not.

4. Predicting the pupils yearly progress in terms of M-S-P performance is not feasible from the present pre-training measures. Although the prognostic values of the Pintner and Metropolitan tests were quite minimal, these tests associated with the M-S-P dimensions to a fairly consistent magnitude. However, it was evident that teacher ratings were completely random in respect to predicting the motor, tactile and auditory performance.

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VIII. APPENDICES

APPENDIX A

TEST INSTRUCTIONS

MATRIX

	Motor	Kinesthetic	Tactile	Auditory	Visual	Graphic
Mobility	AI	BI	CI	DI	EI	FI
Laterality	AII	BII	CII	DII	EII	FII
Directionality	AIII	BIII	CIII	DIII	EIII	FIII
Spatiality	AIV	BIV	CIV	DIV	EIV	FIV
Differentiation	AV	BV	CV	DV	EV	FV
Temporality	AVI	BVI	CVI	DVI	EVI	FVI

The specific activities are coded in accordance with the above enumeration.

Test Instructions

Motor Mobility

A. Materials

none

B. Procedure

Instructor demonstrates once "Angels In The Snow"
standing in upright position.
He then asks the child to reproduce this gesture.

C. Score

0 - no simultaneous arms or feet movement or no response

3 - for both hands in contact

3 - both feet moved outward from stance

3 - integrated simultaneous movement

Test Instructions

Motor Laterality

A. Materials

none

B. Procedure

Instructor asks the child to turn around. He has the child do this 3 times. They may turn either way they prefer. Grade this on the consistency of the way they turn.

C. Score

3-9

3 points for a right, left, right; or a left, right, left; (no two consecutive directions the same)

6 points for a right, right left; or a left, left, right, or a left, right, right; or a right, left, left.

9 points for all three trials consistently right or consistently left.

*(Note to tester:

Break up in sequences to determine preference by interjecting throughout testing sequence, rather than in an immediate test series.)

Test Instructions

Motor Directionality

A. Materials

none

B. Procedure

Instructor demonstrates walking in a square.

Emphasize making sharp corners.

C. Score

Criteria is directional changes executed correctly

3 points for each corner

Corners 1 - completely cuts across & leaves out corners

2 - slurs corners (rounded)

3 - sharp corners

0 - no response

Test Instructions

Motor Spatiality

A. Materials

2 wicket frames - adjustable - 1 foot apart

B. Procedure

Instruct the child to crawl from start position 8 ft. away - through the hole, underneath the flag. The child has three trials. The size of the opening is 16" x 16" for testing purposes. Any variation in size is recorded by tester. The instructor tells the child to be sure and not touch the sides, before he begins.

C. Score

If he touches top or sides he loses 1 point, if he touches again he loses another, etc., up to 9 points of scoring. Observation is made of child from time he begins to enter the wickets until he finishes at other end and is standing up.

Perfect score would be 9 and subtract 1 point for each touch from this.

Test Instructions

Motor Differentiality

A. Materials

none

B. Procedure

Instructor asks child to show him (1) how people dance, (2) how people skate, and (3) how would you fly if you could fly? Notice the child's movements in each category.

C. Scoring

(1) 0 or 3 points

(2) same

(3) same

A

Test Instructions

Motor Temporality

A. Materials

jump rope, chair

B. Procedure

Instructor demonstrates with a child. The instructor holds a rope that is tied to a chair and he raises it to 3" from the floor and instructs the child to jump over the rope. Then the instructor says, "Now I am going to swing the rope back and forth just a little bit and I want you to jump over it again." The rope is still held 3" from the floor during the swinging motion. Instructor swings rope no wider than the width of the chair. The child has 1 trial.

C. Score

0 - complete failure

3 - one foot over

6 - jumped over but he touched the rope

9 - perfect trial

Test Instructions

Kinesthetic Mobility

A. Materials

walking board

B. Procedure

Have pupil take off shoes. Instruct child that

he is to walk backward

Turn board to 4" side

Have 1 trial

C. Score

The points are broken down into these scoring areas.

3 - mounting backward without having to turn around

(2 - if he turns around)

3 - walk span without stepping off

(0 - no balance

1 - steps off 3-4 times

2 - steps off 1-2 times

3 - doesn't step off)

3 - descending without having to turn around

2 - if he has to turn around before descending

0 - no response

Test Instructions

Kinesthetic Laterality

A. Materials

piece of paper wadded up into small ball

B. Procedure

Place paper on the floor at the exact midline of the child for both kicking and throwing.

Verbal directions: Instructor says:

(1) trunk "Put your feet together; now look at me; now turn your whole body without turning your feet."

(2) kick "Now show me how you kick"

(3) throw "Throw the piece of paper that you kicked."

Child gets 1 trial for each procedure.

C. Score

Trunk

1 - if movement is alternated RLR or LRL

2 - if movement is RRL or LLR or RLL or LRR

3 - all three movements the same (LLL or RRR)

0 - no response

Throw - score the same as above

Kick - score the same as above

Test Instruction

Kinesthetic Directionality

A. Materials

none

B. Procedure

Verbal directions.

Instructor says, "How does a saw go? How does a yo-yo go? How does a bicycle wheel go?"

C. Score

Saw - score either a zero or a three. No in between score

Yo-yo - same as above

Bicycle - same as above

Test Instructions

Kinesthetic Spatiality

A. Materials

stick 1" x 1" x 12"

one stopwatch

3 discs of construction paper - 5", 10", 15" in diameter

B. Procedure

Instructor has the child stand on the stick on one foot with his hands on his hips. He is to do this for 6 seconds.

Have child show you how big the disc is. (use 10" disc on wall as guide) Give the child the 3 discs and have them choose the correct size of the large disc.

C. Score

1. stick - 0 - no balance or no response
   2 - 3 seconds
   4 - 6 seconds
   6 - 9 seconds without taking hands off hips or putting other foot down.
2. disc - 0 - no response
   1 - if chooses 15" disc
   2 - if chooses 5 " disc
   3 - if chooses 10" disc

Test Instructions

Kinesthetic Differentiation

A. Materials

none

B. Procedure

Instructor asks child to "Show me how you would bounce a ball, throw a ball, and catch a ball. Now walk slowly backward for me. Next, have them put feet together and hands on hips. Now bend over, lean back, and now kneel down."

C. Score

bouncing a ball - 1 point if he doesn't
0 if he doesn't

throw a ball - same as above

catch a ball - same as above

walk - 0 - no response
1 - going backward
1 - going slowly
1 - without looking

bend over - 1 point

lean back - 1 point

kneel down - 1 point

*(Note whether the child uses two hands to bounce the ball)

Test Instructions

Kinesthetic Temporality

Materials

none

Procedure

Demonstration by instructor

Demonstrator clap hands three times, then waits 2 seconds and then claps three times more. The child reproduces this.

Demonstrator stamps feet in a pattern of 2 times, rests 2 seconds then 2 times more. Child reproduces this.

Scoring

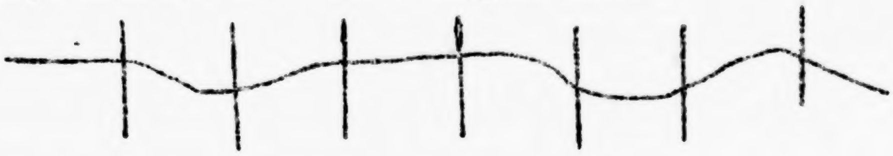
1. clap 1½ points for initial 3 claps
   1½ points for pause
   1½ points for final 3 claps
2. stomp 1½ points for initial stomp
   1½ points for pause
   1½ points for final stomp

Test Instructions

Tactile Mobility

Materials

rope 9 feet long (carpenter's twine) taped to floor with red masking tape markers at 1 foot lengths all along the rope.



Procedure

Children are masked. Instructor instructs child as to what to do. "Do you feel that rope? I want you to walk on the rope. Be sure your foot is on the rope for each step. Both feet should be on the rope at all times like walking a tight rope. This is done without shoes.

Scoring

1 point per step

child is expected to keep in tactile contact with the rope from beginning to end. Rope is marked at every foot by red tape. Score according to distance

Scoring on 0-9 scale

Test Instructions

Tactile Laterality

Materials

1 cigar box for 1 kit

small ball	large ball
large car	small car
small box	large box
large crayon	small crayon
small wheel	large wheel
large man (rubber)	small man (rubber)

mask

stopwatch

Procedure

Instructor first masks the child and places him seated at a table. Have the child open his hands in front of him. Then the instructor places a small ball in one of the child's hands and a large ball in the other hand. Then he asks the child to tell him what he has in his hands. This continues until all objects are named. Instructor alternates the size of objects, so as not to get same size objects in same hand all of the time. Record which hand identifies object first either by observing reaction or inquiry. Instructor may ask child which is the object and then ask child to hand him the object as soon as he has identified it. Start timing child when he gets both items in his hands.

Score

1½ points per item. Add up just the items that are the same.

Test Instructions

Tactile Directionality

Materials

mask

pencil

Procedure

Ask child to show where "he was touched". Or he may duplicate this or show you. Child is masked during this test. Instructor does this:

touches arm with the pencil (eraser end)

touches the nose with the pencil

touches the stomach with the pencil

touches the lower self with the pencil

touches the shoulder with the pencil

touches the head with the pencil

After each time he asks child "Where did I touch you?"

Scoring

1½ points for each item

0 - for no response

½ - for opposite side

1½ - for correct response

Test Instructions

Tactile Spatiality

A. Materials

mask

1 - 4" x 4" disc of wood (wheel)

1 - 4" x 4" block of wood (box)

1 - 4" base pyramid (tent)

B. Procedure

Instructor blindfolds the child and then asks him to find the objects on the table that is most like (1) a big wheel, (2) a box, (3) a tent. Each object is returned to the table after being identified, mix them up after each identification.

C. Score

0 - no response

3 - 1 correct identification

6 - 2 correct identification

9 - 3 correct identification

Test Instructions

Tactile Differentiation

A. Materials

1 cigar box

1 mask

2 pieces of emery paper 2 x 2

2 pieces of felt 2 x 2

2 pieces of plastic 2 x 2

2 pieces of screen 2 x 2

2 pieces of wood 2 x 2

2 pieces of paper 2 x 2

B. Procedure

Instructor has 1 set of items by him to give to the child. The other set is in the box. The instructor gives the child the piece of felt to keep in his hands and says, "Feel this - now find the same thing in this box in front of you." Then the instructor does this with all the items. All the other items are used in the box as detractors. Put each item back in the box after they have identified it.

C. Score

1½ points a piece

Test Instructions

Tactile Temporality

Materials

mask

pencil

Procedure

The instructor touches child on the inside of his arm with eraser part of the pencil one time. Then he asks the child to do the same thing to him. Then the instructor touches the arm again, twice this time. The child is asked to repeat the pattern. Then the instructor touches the child's arm three times and asks him to repeat that sequence.

Scoring

2 points for repeating 1 touch

3 points for repeating 2 touches

4 points for repeating 3 touches

Test Instructions

Auditory Mobility

A. Materials

1 clicker

1 chair (child's or teacher's)

B. Procedure

(Instructor demonstrates.)

Instructor asks child to walk around the chair until he hears the clicker. Then he turns around and goes the other way until he hears the clicker again, and then he turns and goes the other way again. He is told this before he starts his trial.

The instructor clicks 3 times. Instructor should also hide the clicker behind him.

C. Score

3 points per click

Test Instructions

Auditory Laterality

Materials

box - 4½" x 4½"

Procedure

Have child stand directly in front of instructor and face him. Then ask the child to put his ear to the box and listen for the sound. 3 trials. Instructor can make a scratching noise so that child will hear something.

Scoring

9 - RRR or LLL

6 - RRL or LLR

3 - RLR or LRL

0 - no response

Test Instructions

Auditory Directionality

Material

mask

clicker

Procedure

Child is masked, sitting in chair with back toward examiner. Instructor makes a clicking sound in the following places:

1. overhead of child
2. below waist line of child
3. behind child
4. front of child
5. right side of child
6. left side of child

Scoring

1½ points for each accurate location

Test Instructions

Auditory Spatiality

Materials

mask

clicker

Procedure

Have the child stand 10 feet away from instructor with his back to the instructor. Then tell him that he will hear 1 click. Have him point to where the noise came from. Instructor provides a click from the following positions:

(1) backside - 10' away

(2) 90^{o} angle on right side - 10' away

(3) 90^{o} angle on left side - 10' away

Scoring

3 points per trial

Score as a correct response if pupil points to the side of tester's body from which the sound originated.

*Trials should be done on carpet so footsteps are not audible. Examiner does not say anything. Other testing people will ask where click comes from.

Test Instructions

Auditory - Differentiation

A. Materials

A small chart with the following paired words on it, for examiner to read from:

	A.	B.
demonstration item:	cat-cat	cat-bat
test items:	ship-ship	chip-ship
	pole-pole	pole-bowl
	bed-bread	bread-bread
	zoo-shoe	zoo-zoo
	block-block	clock-block
	coat-coat	coat-goat
	chain-chain	chain-train
	pen-pen	pan-pen
	fox-socks	fox-fox
alternatives:	toes-toes	ties-toes
	ice-eyes	eyes-eyes
	ring-ring	ring-wing
	mouse-mouth	mouth-mouth

B. Procedure

The examiner will tell the pupil that he is going to say two words together and he needs to listen carefully and see if they were the same or were they different. For example, using the demonstration item pronounce clearly "cat-cat", ask pupil if they were the same or different. Then say clearly "cat-bat" and ask again. Note pupils response. If pupil has the idea proceed to test items 1 to 9. Go through list A then list B. Use alternates if examiner goofs on a test item.

C. Scoring

Score ½ point for each correct recognition that they are the same or different.

Test Instructions

Auditory Temporality

A. Material

2 sets composed of a small bell and a small clicker. (One set for pupil and one for examiner).

B. Procedure

Instruct the pupil to take the bell in one hand and clicker in the other. Then ask him to do just like you do it. Give him a demonstration by first ringing bell then clicking. Repeat until he seems to have the idea but do only one then the other.

The test items are:

1. bell - bell - click
2. click - bell - click
3. bell - click - click
4. bell - click - bell
5. click - click - click
6. click - click - bell

C. Scoring

There are eighteen bells or clicks, score ½ point for each correct reproduction.

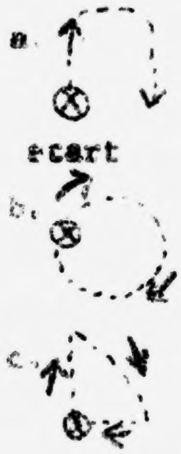
Test Instructions

Visual Mobility

A. Materials

3 charts out of cardboard 12" x 12"

1. little footsteps indicating which way they are to go



B. Procedure

Instructor shows the pupil the first card and asks the child to walk the way it shows on this card. No demonstration should be given. The same procedure is done on the next two charts. The child is to perceive visually what he is to do without verbal help.

C. Score

3 points per chart

chart A 0 - no response

1 point for going up,

1 point for a correct turn,

1 point for going back down.

chart B 1½ points for closure of circle

1½ points for circular pattern rather than cornered

chart C 1 point for each corner

1 point for closure

Test Instructions

Visual Laterality

A. Materials

paper cylinder

B. Procedure

Instructor asks the child to look through the cylinder and look at the clock on the wall. Be sure to place the cylinder directly in front of them on the table, so they may pick it up with whichever hand they prefer. Observe which eye the cylinder goes to and record preference.

*3 trials done at different times during the testing.

Other two times:

(1) look out the window

(2) look at the door

C. Score

9 - for a RRR response or a LLL response

6 - for a RRL or LLR

3 - for RLR or a LRL

Test Instructions

Visual Directionality

A. Materials

pencil or penlight

B. Procedure

Instructor has child facing him. He then raises the pen light and moves it first in a circular motion and asks the child to keep his head still and just move his eyes. Then he moves the pen light up and down, then back and forth, then diagonal, and the converges to the nose, wi[illegible] light turned off.

C. Score

1½ - circular

1½ - up and down (vertical)

1½ - back and forth (horizontal)

1½ - diagonal

0 - 3 convergence

1 point for 9" before breaking
2 points for 6" before breaking
3 points for 3" before breaking

Test Instructions

Visual Spatiality

A. Materials

None

B. Procedures

Instructor asks the child the following things:

"Which wall is closer to you?" (the instructor points to side walls) (Child is 1/3 distance from 1 wall and 1/4 from the other)

"Which wall is closer to you?" (use end walls with distance)

"Is your head closer to the ceiling or the floor?"

C. Score

3 points for each item

1 or 3 - either they respond correctly or they don't

Test Instructions

Visual Differentiation

A. Materials

3 shapes - free form

Test size chart is 5"

5 different sizes of each one (6½, 3½, 4, 6, 5") on answer chart

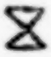
chart a. 

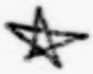
chart b. 

chart c.

B. Procedure

Instructor shows child chart a.

Have the chart visible. Then ask him to select the one from the answer chart that is the same size as the test size.

Repeat this for chart b. and c.

C. Score

3 points for correct identification

0 for wrong answer or no response

Test Instructions

Visual Temporality

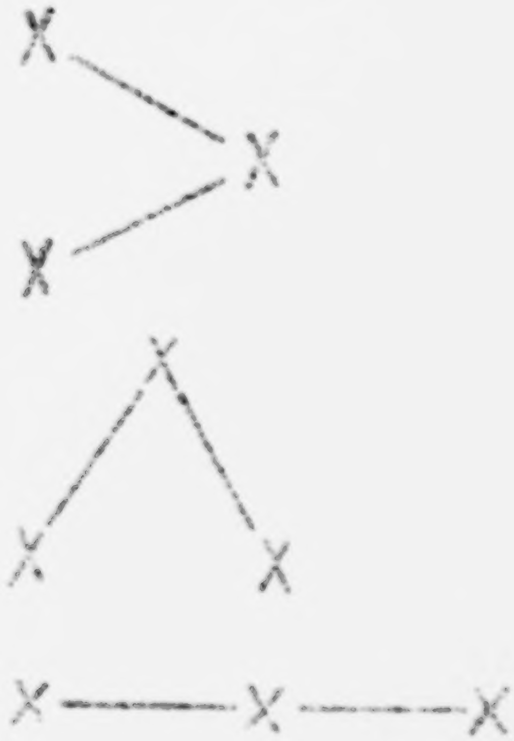
A. Materials

2 penlights

B. Procedure

Instructor asks child to reproduce the following sequences of light patterns, demonstrated by the examiner.

Blink light at "X":



C. Score

1 point for each blink in correct place

Test Instructions

Graphic Mobility

A. Materials

paper

crayons

B. Procedure

Instructor walks in a straight line and then asks the child to reproduce this pattern on paper. Tell the child to watch the instructor's feet. Then he walks in a circle and has the child. reproduce this. Then in a square pattern.

C. Score

3 points per item

straight line - 3 points or 0

Circle 0-no response

1½-rotary pattern of any kind

3-rotary pattern plus closure

Square 0-no response

1 point for each corner

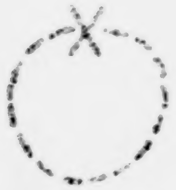
Test Instructions

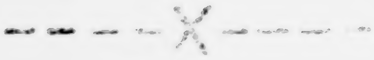
Graphic Laterality

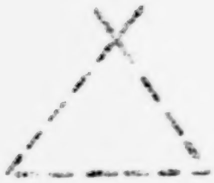
A. Materials

3 ditto sheets

crayon







B. Procedure

Instructor asks the child to trace the circle on the paper. Have the child start tracing at the "X". Notice which way he starts to draw it. Then he does the horizontal line, then the triangle. One trial on each item. Record which direction he starts the drawing.

C. Score

3 - RLR or LRL

6 - RRL or LLR or RLL or LRR

9 - RRR or LLL

Circle

Horizontal line

Triangle

Test Instructions

Graphic Directionality

A. Materials

3 models on cardboard

1. ○
2. □
3. X

paper

crayon

B. Procedure

Instructor gives child a crayon and piece of paper. He then holds up chart #1 and asks the child to draw the same thing on his paper. He then does the same with chart 2 and 3.

C. Score

chart 1 - ○

1 - closure

1 - rotary direction

1 - size

chart 2 - □

½ - closure

1 - size

½ - for each of 3 corners

chart 3 - X

1 - non vertical lines

1 - non horizontal lines

1 - crossing

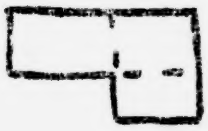
Test Instructions

Graphic Spatiality

A. Materials

Cardboard chart with "X" on it

ditto sheets



B. Procedure

Instructor instructs the child to play 3 "X"s in this form. Notice where the child places his "X"s. If need to, show the child on a separate sheet of paper how to make an X. You will also have the cardboard chart with an X on it to show the child so that he can copy.

C. Score

3 - location of X's - 1 point for each X

3 - structure of X's - 1 point for each X

3 - confined X's to square on stencil - 1 point for each X

Test Instructions

Graphic Differentiation

A. Materials

paper with X X X X

crayons

B. Procedure

Instructor gives the child the ditto and crayon. He then asks the child to draw circles around the first X. (The X's are already drawn on the ditto.) Have the child draw a circle around the next X and make it bigger than the first X. Then tell the child to draw just a bigger circle around the next X, etc.

C. Score

3 points for each consecutive increased size for total of 9 points.

Test Instructions

Graphic Temporality

A. **Materials**

ditto sheet

pencil

B. **Procedure**

Have child make as many circles as he can on the line for 10 seconds. Encourage the child to not stop until he's told to. Show him how he can go on to the next line, if he runs out of space.

C. **Score**

0-9 **Circle number of circles he made.**

APPENDIX B

TRAINING
ACTIVITIES

Kindergarten Motor-Sensory-Perceptual Research Project

Developmental Activities

These experimental activities were developed as part of a project funded by the U. S. Office of Education, under the joint sponsorship of the Rowland School District and the University of Southern California.

The program was designed to provide units of activities to cover approximately sixty minutes a day for a six week period.

Motor-Sensory-Perceptual Response Systems

Central Sensory Function		Motor 1st week	Kinesthetic 2nd week	Tactile 3rd week	Auditory 4th week	Visual 5th week	Graphic 6th week
Central Sensory Function	**Mobility**	Monday					
	Directionality	Tuesday					
	Spatiality	Wednesday					
	Differentiation	Thursday					
	Temporality	Friday					

Across the top are six response mechanisms that reflect the major sensory systems utilized by the child in his typical school behavior. Down the side are five central sensory processes that are sought to be enhanced by the program activities. The pupil's conceptualization of movement, direction, space, differences and tempo are reflective to his central nervous system functioning. The six week periods of activities are repeated four times consecutively. The activities were developed in conformity with the belief that enhanced performance will contribute to the pupil's better achievement.

Seven experimental teachers implemented the training phase on a daily basis for an entire class during the 1966-67 school year. These teachers were:

Billie Van Noy - Villacorta
Alice Hill - La Seda
Mayme Green - Rowland
Barbara Jenkins - Farjardo
Diane Kohl - Killian
Patti Morgan - Blandford
Sandra Wong - Hurley

The activities were the results of the collaborative efforts of William K. Reece, Glenda Dickerson and Hilda Walrath of the Rowland School District.

MATRIX

	Motor	Kinesthetic	Tactile	Auditory	Visual	Graphic
Mobility	AI	BI	CI	DI	EI	FI
Direction-ality	AII	BII	CII	DII	EII	FII
Spatiality	AIII	BIII	CIII	DIII	EIII	FIII
Differen-tiation	AIV	BIV	CIV	DIV	EIV	FIV
Temporal-ity	AV	BV	CV	DV	EV	FV

The specific activities are coded in accordance with the above enumeration.

Motor - Mobility - Monday

1. Cross Pattern Walking

You demonstrate this activity by walking--and at the same time you are walking, point the opposite finger at the toe that is out in front. For instance, when your left foot is out in front of you, your right hand points to the left toe as if "shooting it off" with a gun. Then as your right foot comes out in front of you, point your finger of your left hand at your right toes, and you keep repeating this pattern as you walk, alternating as you go. Your eyes also are on your feet while doing this. Your eyes are focused on the foot that is out in front so that your hand and eyes are synchronized on the foot out front.

Take a small group of children at a time--about 7 or 10. After you have demonstrated this activity, take each child individually and walk him through it, making sure he knows what he is doing. He may not be able to accomplish this at first, but if he understands what you are doing, he can then practice it. Try to correct as many children as possible as they are doing it.

After all children have been shown how to do this, you can line them all up and have them follow one child around the room performing this activity. This way you can be working with a few that need help at this time. They might even do this when going from one place to another in the room during the entire morning.

Do this for 5 minutes at a time.

Motor - Mobility - Monday

2. Duck Walk

To demonstrate this activity have a child squat down, resting his tail end on the back of his legs. Then have him clasp his arms around in front of his legs. Then tell him to start walking. He will "waddle" like a duck, as he proceeds to walk.

This activity can be done by a "follow the leader" type of game - inside or outside.

Do this for 5 minutes.

Motor - Mobility - Monday

3. Crab Walk

Ask the child to squat down reaching backward and putting both hands flat on the floor behind him without sitting down. Ask him to walk in this position. He should keep his head, neck and body in a straight line.

Do this for 5 minutes.

Motor - Mobility - Monday

4. Angels In The Snow

To demonstrate this activity, put the feet together and hands down at your side. The next part is done like the football boys do calisthenics. Raise your arms, keeping the elbows stiff, above your head and clap your hands at the top. At the same time this is being done, your feet leave the position of being together and both of them go toward the outside to a wide stance, keeping the knees stiff. Then when you bring your arms down to your side again, your feet at the same time go back in together. These two are to be coordinated so that when the hands go up, the feet go out; when the hands come down, the feet come in together. You should demonstrate this activity yourself and then show the children how to do it.

Do this for 5 minutes.

Motor - Mobility - Monday

5. Measuring Worm

This can be demonstrated by a child. Have the child stand up; then put his hands on the floor, way out in front of him (at the same time keeping his toes flat on the floor), and about shoulders width apart.

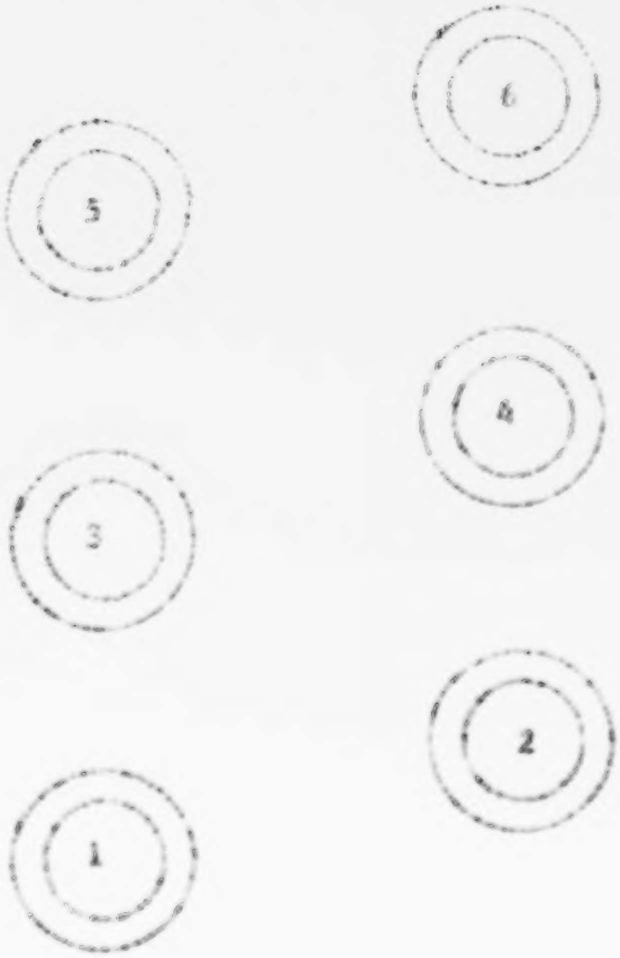
His legs should be stretched out straight behind him with the weight of his body supported on the arms and toes. The arms should be kept straight and the body should be straight from head to heels. Keeping his hands stationary and knees straight, ask him to bring his feet up by little steps until they are as close to his hands as possible. Next, keeping his feet stationary, ask him to move his hands forward with little steps until he has reached the "starting" position again. This series of movements is repeated as the child progresses forward across the room.

Do this for 5 minutes.

Motor - Directionality - Tuesday

1. Tires

In this activity you have 6 tires to place on the playground in this pattern below. The tires are lying down flat.



You have the child start at tire #1 and he places his left foot in the center; then he puts his right foot in the center of #2 and left foot in #3 and so on. After he gets the idea of what to do, have him go through the activity as fast as he can. You may demonstrate this with a child. You may put a number on the tires, if you like.

Do this for 5 minutes at a time.

All

Motor - Directionality - Tuesday

2. Ladder

Show the child how to step between each rung of the ladder while it is lying out flat on the ground. He does not hop through this, he alternates his feet--just naturally walks through only does not step on the rungs, but in between.

This ladder is placed after the tires, so that they can go from the tires to the ladder activity.

Do this for 5 minutes at a time.

Motor - Directionality - Tuesday

3. Turning Bar

This activity is done after the child has stepped through the tires and then walked in between the rungs of the ladder. Then he goes to the turning bar and flips over the top, holding on with both hands.

Do this at least 5 times.

Motor - Directionality - Tuesday

4. Table Crawl

This activity is done by the child climbing the blocks to get up on top of the table. Then he crawls across the 2 tables and goes down the block steps on the other side.

Do this for 5 minutes at a time.

Small blocks are used for the first step and larger blocks for the next step and then two blocks put together for the third step. The fourth step puts them up on the table.

Motor - Directionality - Tuesday

5. Balloon Circle Game

This game is played with balloons and the children are in a circle. One child throws the balloon up and the object of the game is to keep the balloon up in the air at all times. They bat it with their hands. Several circles can be going at one time, so that your circles can be smaller and more children will get to bat the balloon.

Do this for 5 to 7 minutes.

Motor - Directionality - Tuesday

6. Twirling

Tell the children to start twirling and when they hear your whistle, they stop and try to walk in a straight line. Do this several times.

Do this 5 minutes if time permits.

Motor - Spatiality - Wednesday

1. Obstacle Course

Line all of the children up in a line and they can go through the following activities one right after the other.

First have them crawl through the tire that is hanging down from the turning bar and then he crawls through the barrel.

He can repeat this pattern after he has finished.

Do this for 5 minutes at a time.

Motor - Spatiality - Wednesday

2. Poison River

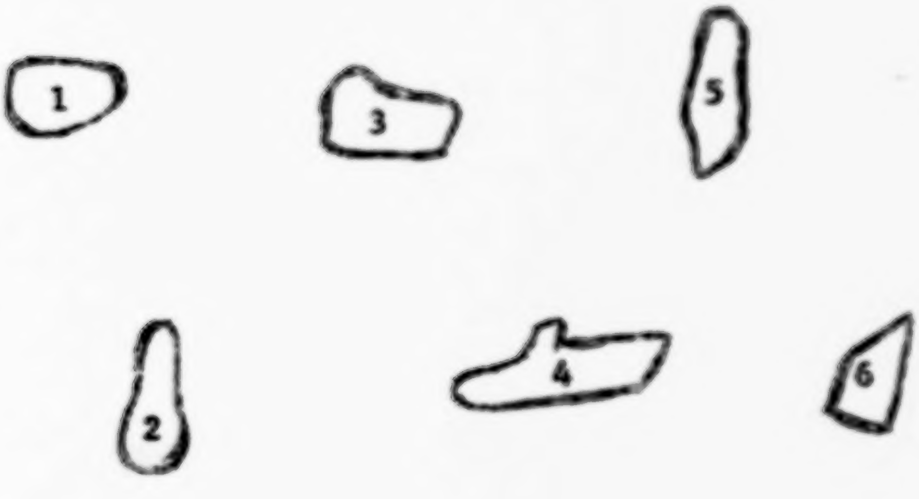
This game is played with two lines that are in a \ / pattern. Have the child start at the smaller end of the pattern and jump across. If he clears the lines then he gets to move up a little and try a wider area to jump. This can be done by lining the children up and they jump one right after the other one has jumped.

This can be done with masking tape. Have 6" width at the narrow end and a 3 foot width at the wide end.

Motor - Spatiality - Wednesday

3. Stepping Stones

Have the child start at one end of the pattern of stones and place one foot on one of the stones. Then he walks the stones, alternating his feet. The stones are placed in a similar pattern to the one below.



Have the child place left foot on stone #1 and the right foot on #2 and so on until he is through.

You may line the children up again and have them go through this one right after the other.

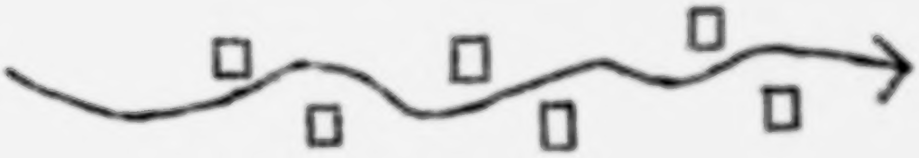
You may also put numbers on the stones, if you like.

You may put masking tape on the stones to hold them to the asphalt.

Motor - Spatiality - Wednesday

4. Snaking Chairs

Place 6 chairs in the pattern below:



Have the child start at 1 end of the chairs and have him wind in and out of the chairs, trying not to touch them or knock them over. If he accomplishes this relatively well, place the chairs closer together and at smaller angles.

Motor - Spatiality - Wednesday

5. Board Crawl

10' board 8" wide with small blocks under each end of the board to hold it up off the ground.

Have child crawl across board on his hands and knees. Don't worry about child falling off, as he is close to the ground. Then have him crawl backward across the board.

Motor - Differentiation - Thursday

1. Directed Group Participation

Have the children change rapidly from one activity to the other one. Start with running, then blow your whistle and tell them to hop, then whistle and then they skip, then walk backward, walk sideways, march, jump with both feet, skate, dance, swim, climbing, crawling, fly and twirl.

On some of the activities tell them they have to "pretend" to be doing the activity (skate, dance, swim, climb, fly).

Make sure you blow the whistle after each activity and have them go immediately to the next one. Don't allow any time in between if you can help it. In other words, don't let them stand still between activities--keep them going.

This activity can also be done by playing "follow the leader" and then they just follow what you do and there is no lapse in between. You could still blow your whistle to let them know to pay attention because you are going to change to something else. You could also line them up facing you instead of behind you so that you could see them.

Motor - Temporality - Friday

1. Jump Rope

Have 4 ropes going at one time. Use 8 older children for this short period of time to turn the ropes for you. Start the children on one of the ropes and they can jump 3 jumps, then that child goes on to the next rope and jumps three times and so on. Then another child has already started jumping on rope #1 as soon as the other child has moved to rope #2.

Motor - Temporality - Friday

2. Freeze

This activity is a game that is played by having the children start twirling around and around, their arms either extended out or up--either one they want to do. Then at a given time you blow a whistle and they stop twirling and try to retain their balance in whatever position they were caught in when you blew the whistle. It's like the game of "statues" that many of you have played before. You may repeat this several times. Let them twirl several times, but not so many that they will fall. Demonstrate this before starting the game. Encourage them to try to remain as a statue in a funny position after you blow the whistle.

Motor - Temporality - Friday

3. Musical Chairs

This activity is done similarly to the original game only the children are not eliminated. Have the chairs in two lines back to back, and have one chair less than the number of children present. Start the music and have the children start marching around the chairs. When you stop the music, they scramble for a chair. One child won't get to sit down. Then start the music again and all start going around the chairs again, even the child who lost out the last time. When you are ready to wind up this activity, you can play the original game where you remove a chair each time the music starts and the child left out can go sit on the rug and wait for the next activity. More than one chair can be removed at a time to speed this up.

Kinesthetic - Mobility - Monday

1. Walking Board

Start the child at one end of the beam. Ask him to walk to the other end. Give no further instructions. Observe the manner in which he is able to balance himself on the beam. If he is able to catch his balance and correct himself he is okay. If the child attempts to place his feet crosswise on the beam, or scoot along inching his way forward, then instruct the child to place his feet straight along the board, one in front of the other.

Start the child at one end of the beam with his back toward it and the board extending out behind him. Ask him to step up on the beam and walk backward to the other end. If the child tends to turn his body around to look behind him so that he can see where he is going, stress to the child to try to walk it without looking back. Feet should be placed one in back of the other, and again straight on the board.

Kinesthetic - Mobility - Monday

2. Hopping

The teacher may demonstrate this activity. Show the children first how to hop on one foot and then the other foot. Then show them how to hop on both feet at once. They can go forward, backward, and sideways.

This can be a group activity and follow-the-leader can be used.

They can also alternate feet while hopping to get some change in. They can also hop 3 hops on the right foot, three on the left, 3 on both, and then repeat the pattern. This could be also done forward first, then when they have finished that, they could go backward with the same pattern being used, and then sideways.

Kinesthetic - Directionality - Tuesday

1. Throwing - Bouncing - Catching

Give one ball to every two children. Have them get far enough apart that the ball when thrown can bounce at least once. Then have one child throw the ball to the other one. The other child tries to catch the ball and then throws it back to his partner.

Kinesthetic - Directionality - Tuesday

2. Kicking

Give each 2 children a ball and let them walk in pairs. One child gets on one side of the playground and the other child gets on the other side. Then one child takes the ball, places it on the ground in front of him, then he kicks the ball and goes after it and kicks it again. He is to direct his path toward his partner. He also is to alternate feet when he is kicking the ball. When he reaches the other child, he gives the ball to him and he kicks it back to the other side. When he reaches the other side, he turns and comes back. When he returns, he gives the ball to his partner and his partner continues. The object is to keep the ball in motion at all times, so urge them to follow the ball quickly and to kick it often, remembering to alternate their kicks.

Kinesthetic - Speciality - Wednesday

2. Balancing

Show the child how he can walk on his heels, then on his toes. Then let him try. Have him walk around the room doing this. Then show the child how to stand about an arms length from the wall, with his feet together. He is to be facing the wall. He then falls stiffly toward the wall catching himself with his hands on the wall. He keeps his feet together and legs stiff during this. Then he is to get back to his standing position without moving his feet to help him do this.

Then he can alternate the activities--walk around on heels and toes and then go to the wall activity and then back to the heel and toe walking again.

Kinesthetic - Spatiality - Wednesday

3. Hopping in Square

Have a small square (4" x 4") taped to the floor. This can be of construction paper or plain white paper. Then have the child hop on one foot, always keeping the foot confined to the paper. Then he can hop on the other foot doing the same. He actually doesn't move, but has a stationary hop. The object is to confine his hopping to a small area.

Have the children pair off and let one of the pair hop at one time and then the other one.

BIII

Kinesthetic - Spatiality - Wednesday

1. Balance Boards

There are 3 sizes of balance boards. Start the child on the largest board. Have him put one foot on the board and then the other one. Then he is to try to balance himself. Encourage the child to rock the board both in the right-left direction and in the fore-aft direction, too. If he accomplishes all 3 boards, he could try to bounce a ball while balancing, or throw a ball to a partner and then catch the ball as it is thrown back.

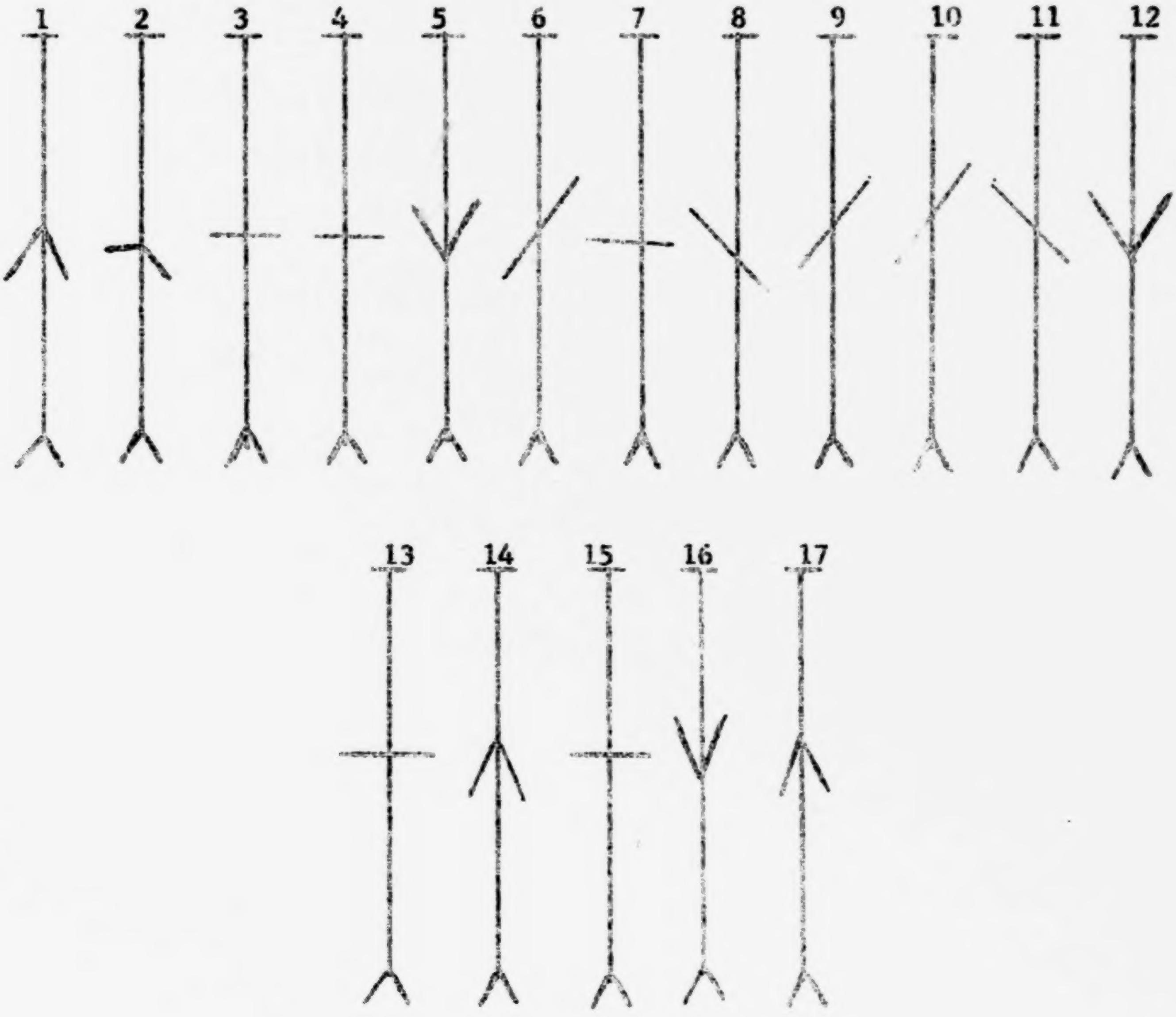
BIV

Kinesthetic - Differentiation - Thursday

1. Imitation of Body Movements and Body Parts Identification.

You do this activity similar to "Simon Says". Although no child is excluded in this game, you have them do just as you do. As you do this, you tell them verbally what to do. For instance, "touch your head" - "touch your toes" - "raise your hands over your head" and so on.

Below is a group of body movements that you can perform. There are many body parts to acquaint the child with. You may intermingle the two areas and make one game out of it.



Kinesthetic - Temporality - Friday

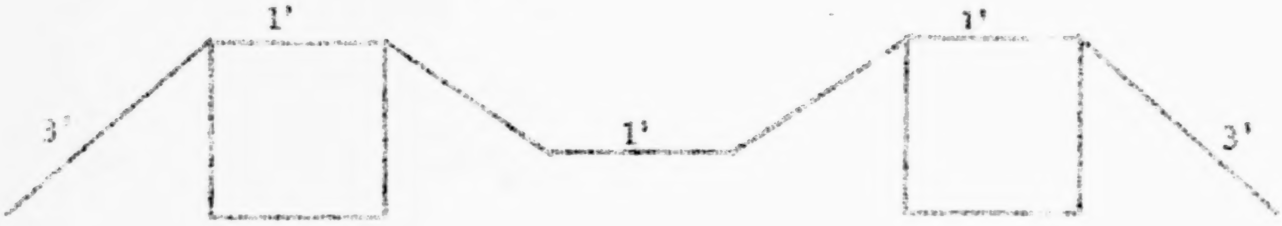
1. Drum

This activity is done by the teacher pounding out rhythm beats on the drum The children can either clap their hands to the beat, or stomp their feet. They can also alternate the two. You can also alternate the beat and change it often. Urge the children to use their ears to listen with or they will miss the beat. Center yourself so each child can see and hear you.

Tactile - Motor - Monday

1. Boardwalk

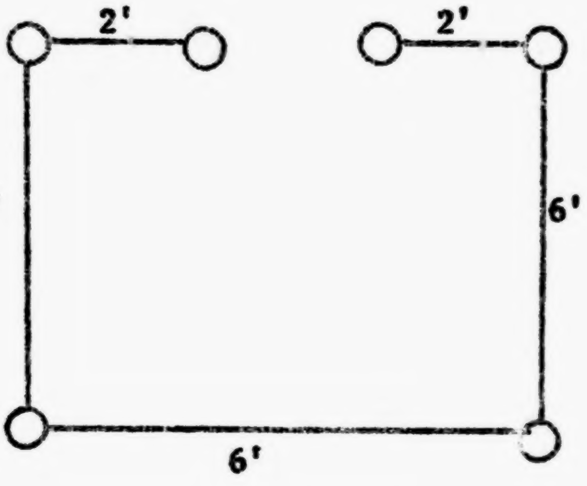
This activity is done by first masking the child, then having him start at one end of the board and carefully walk to the other end, feeling his way. The boards are 3 feet long and 4 inches wide. They will be raised 3 inches off the floor in the middle of each one. A block is placed in the middle to raise it off the floor. The following diagram is how to set up the 4 boards and 2 blocks.



Tactile - Motor - Monday

2. Maze

This activity is played with 3 medium length ropes and 2 short ropes. Six children hold the rope, as in the diagram below:

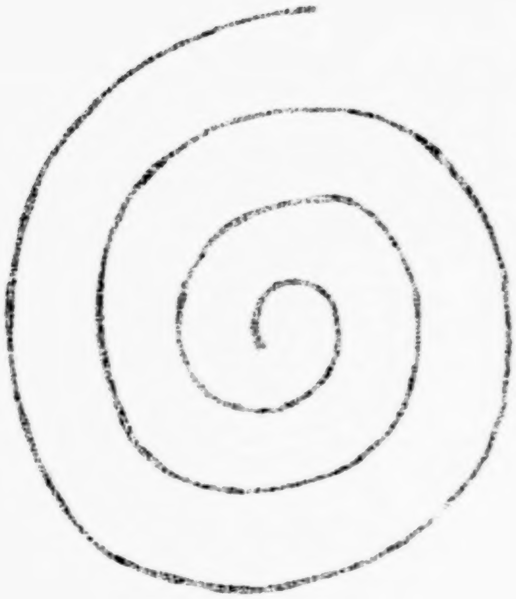


One child is placed inside the square blindfolded, then turned around and around. Then he is told to find his way out by feeling. Several of these squares can be going at one time in order that every child gets a chance to be in the center of the maze and find his way out. After he finds his way out, one of the children holding the rope gets a chance. To make sure the children keep a pretty good square for the maze, you could place masking tape on the blacktop or floor where each child is supposed to stand so that they have a marker to follow. Make sure that they know that they are not supposed to let go of the rope and not to help the one blindfolded.

Tactile - Motor - Monday

3. Spiral Pathway

With a 30-foot rope, make a spiral circle taped to the floor as shown below:

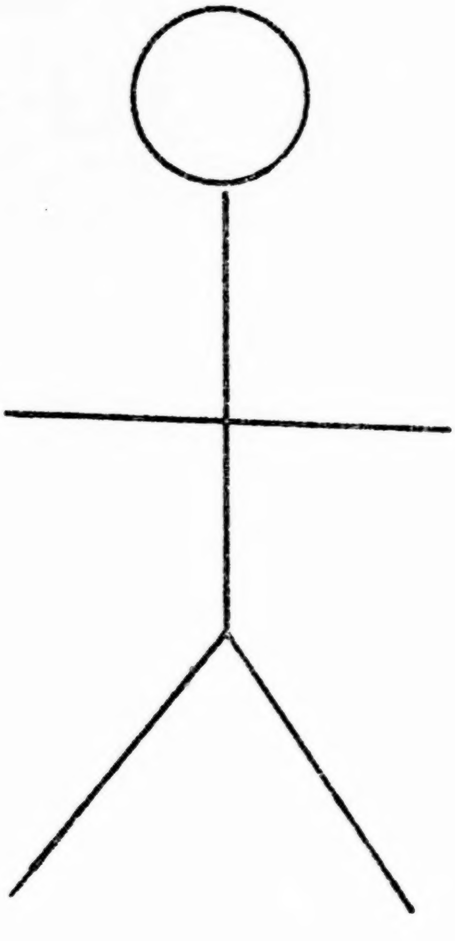


Then blindfold a child and have him follow in between the rope. Make the circle large enough that he won't touch other parts of the rope except the part that he is in between. You can start him from the center and let him work himself out, or at the start and go into the middle. Have several ropes down so that this can be done in less time.

Tactile - Directionality - Tuesday

1. **Circle String Game (small plastic golf ball attached to a long string)**

This activity is done by placing 4 children in a circle, and then one more child masked in the center. Each child in the circle has a string with a ball attached to the end of it. The child in the center starts turning around and around with his arms stretched straight out. Then one child is to throw his ball so that it lands over one of the arms of the child in the center. Then the child in the center takes the string and follows it until he finds out where it leads to. He may stretch his arms straight out in front of him or to the side as he turns. The people in the circle take turns being the masked child in the center. You can have 5 or 6 circles going at once to let them all have a chance.



Tactile - Directionality - Tuesday

2. Tactile Transmission

Make a big circle. Then you start by telling the children that whatever is done to them, they do to the next child. You will start and put your open palm on top of one child's head. He, in turn, turns around and does the same thing to the next child, etc. As soon as that is well started, you may start the next tactile response, so that in a few minutes several things are being done in the circle at one time. Below are the things you are to start, one right after another. When the responses get back to you after going clear around the circle, that response is through.

a. Open palm on top of head

b. Finger on left shoulder

c. Press point of finger on right, then left shoulder blades

d. Press three times on right, left and middle of back

e. Touch high and low on back in a vertical line

f. Touch in a way that makes an ✕

g. Touch in a way that makes a ○

h. Touch in a way that makes a □

i. Touch with two fingers simultaneously on right and left sides of back

j. Touch with two fingers simultaneously, one on shoulder and one on side of rib cage

k. Any other patterns you may wish to try

l. Have pupils turn around and start doing the same pattern facing the other way

Tactile - Directionality - Tuesday

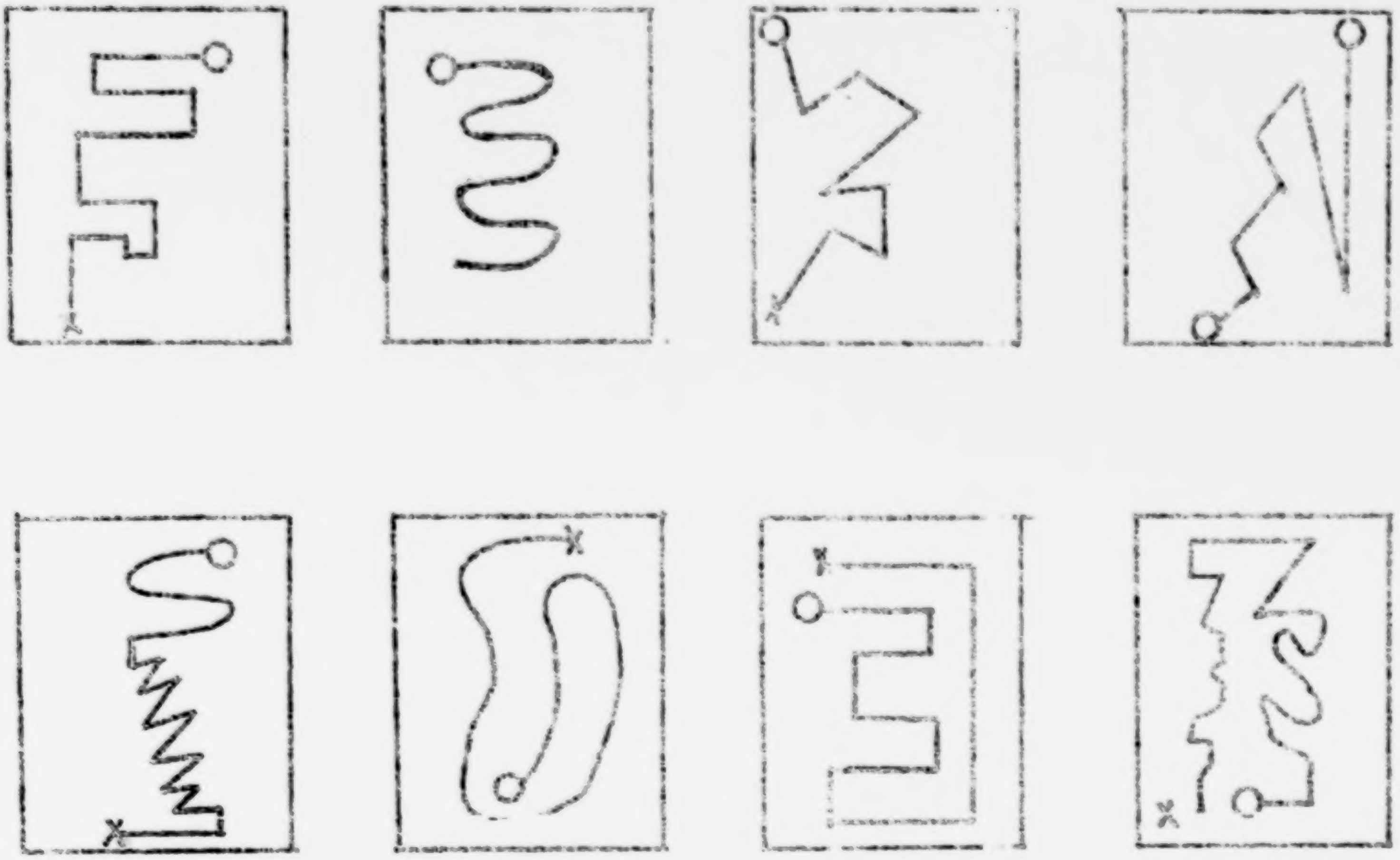
3. Clothes Fun

Have a box of clothes for a boy and a box of clothes for a girl. Then make 2 lines of 10 or 11 in each line--all girls in one line, all boys in the other line. Then mask 1 boy and 1 girl and let them try to put on the clothes that are in the box. After they are through, the next 2 get a chance. While this is going on, your other 8 children are doing the finger mazes. When they are through with the finger mazes, they can come to the clothes box line and do that activity while you choose 8 more to do the mazes. When the child is through with the clothes box line, he then gets in line for another turn--just for fun--until he can go to the mazes.

Tactile - Directionality - Tuesday

4. Finger Mazes

This is done by masking 8 children and giving each 1 maze to follow with his finger. The mazes are made of cardboard with a cut out pattern. The child places his finger in the cut out space and then attempts to follow the pattern. A helper can rotate the 8 mazes so that each child does each maze. When they are all through, they go to the clothes box.



ILLUSTRATIVE

MAZES

Tactile - Spatiality - Wednesday

1. Putting Things Together

Sit the child down at a table blindfolded. Tell him there are things in the box that go together, and that he is to find them and put them together. Then put the box in front of him and let him proceed. You will have 8 boxes so that you can do 8 children at one time. Either get parents or other children to help you and it will be easier. Have the other children doing something else so that they cannot see the objects.

a. Screw together plastic Easter eggs.

b. Plastic nuts and bolts.

c. Small box and top.

d. Small jar and cap.

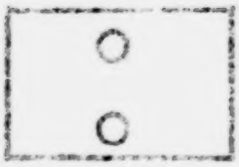
e. Lock and key.

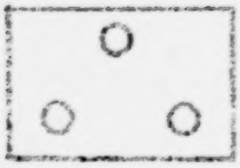
f. Ring on small peg.

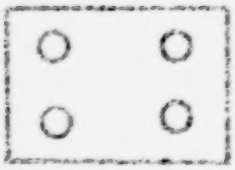
Tactile - Spatiality - Wednesday

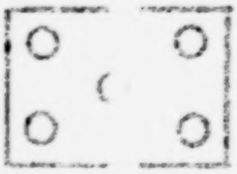
2. Pegboard

Blindfold the child and place him seated at a table with a pegboard in front of him. Tell him that on your board is a design with some pegs. He is to feel the design and then to reproduce it on his board. Start with two pegs, and then work up to more.









Have several pegboards going at one time.

Tactile - Spatiality - Wednesday

3. Beads

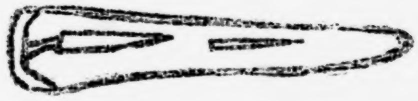
Mask the child and place him at a table. Then give him a shoestring and some beads and ask him to string the beads. Have several going at one time. Have each child string eight beads.

Later see if child can duplicate a pattern or model by feeling one first.

Tactile - Spatiality - Wednesday

4. "Clip On Me" (clips typically used for holding hair in place)

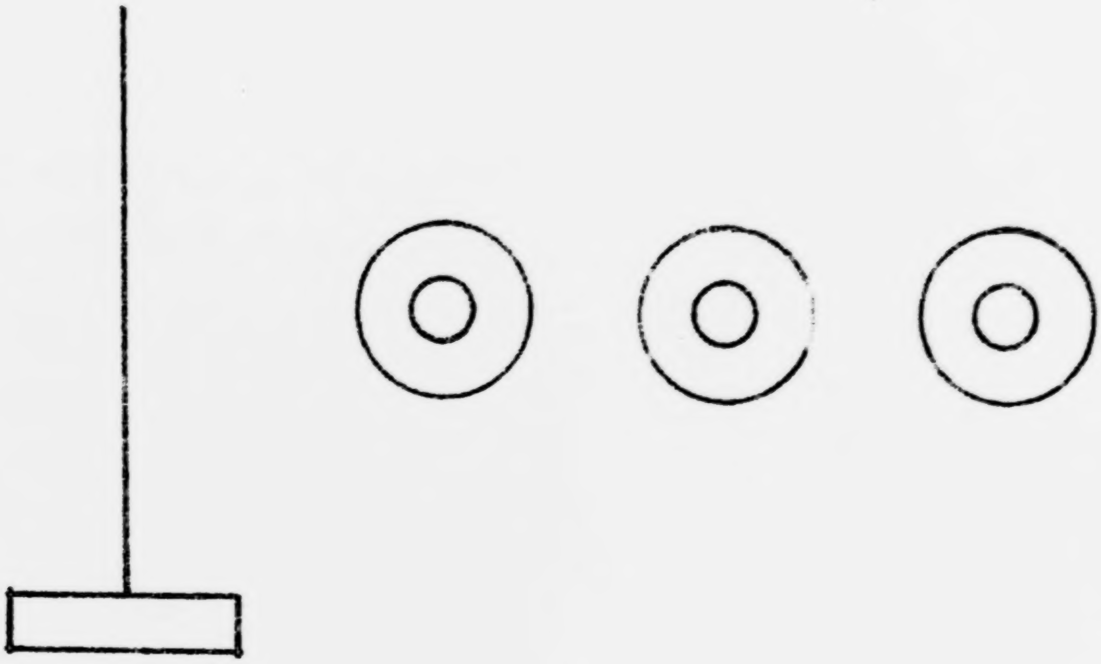
This activity is done by masking the child and then clipping 6 hair clips at different places. Then turn the child around several times. Then he tries to find the clips and take them off.



Tactile - Spatiality - Wednesday

5. Washers on a Stick

Have 8 children masked, sitting at a table. Give each one a set of 12 washers and the stick they go on. Then they proceed to put the washers on the sticks. When through, they can move to another item.



Tactile - Differentiality - Thursday

1. Person Identification

Make a circle of 5 children and then 1 more child masked in the center. Then turn the child around and around and let him find 1 of the other members of his circle and feel him to identify him. Let each child have a chance to be in the center. Have 5 circles going at once, if needed. Also, use a helper, if needed.

Tactile - Differentiation - Thursday

2. Grab Bag

Sit the 10 children down at these bags and let them place their hands in the ends of the bags. They then start feeling to see what is in the bag. Have a helper to work with this group. While these 10 are on the grab bag, the other 20 are doing 2 other activities. Try to place the children where the others can't see the objects in the bag as they are identified. After they finish, they all rotate to 1 of the other 2 activities. If they rotate as a group, it will be easier to tell who has done what.

GRAB BAG ITEMS

COTTON

SPONGE

PLASTIC SPOON

ROPE

BUTTON

PAPER CUP

NAIL

RUBBER BAND

COMB

CRAYON

CHALK

Tactile - Differentiation - Thursday

3. Item Similarity

Sit 10 children down with each 1 having a bag and let them find the items that are the same in the bag. For instance, there will be 2 marbles, 2 plastic eggs, etc. Have another helper for this activity These children are doing this while the other 20 are on 2 other activities.

ITEMS ALIKE

2 EGGS (Plastic)

2 MARBLES

2 CLOTHESPINS

2 BALLOONS

3 SETS OF BEADS - DIFFERENT SHAPES

Tactile - Differentiation - Thursday

4. Beads

Mask 10 children and let them each have a shoestring and 8 beads. Tell them to string the beads. When they are through they rotate to one of the other groups. You are to make a pattern with the beads and they feel it and then reproduce the same pattern.

Tactile - Temporality - Friday

1. **Dominoes**

Mask the child and let him feel the dominoes with 1 hand only (1 domino at a time). After he has felt the first domino then he is to reproduce the number of dots that were on the domino with the other hand that has a rhythm instrument.

Then give him the next domino, and etc., until you've given him all 4 dominoes. Vary the numbers so that they do not come in sequence. Have 10 children do this activity at 1 time.

Tactile - Temporality - Friday

2. Feathers

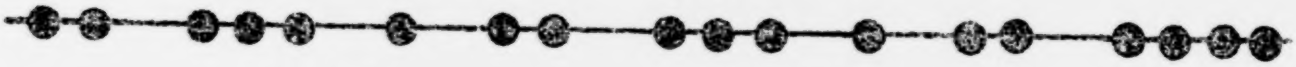
Line the children up--about 10 at a time in 2 lines facing each other. One line is masked, the other line has the feathers. Have the child with the mask on hold his hands out in front of him with the palms up. Then the child with the feather runs the tip of the feather over the other child's hands and the masked child then tries to grab the feather as soon as he realizes what direction it is going. Have them go different directions on the palm of the hand, so that the masked child cannot anticipate what is next.

Tactile - Temporality - Friday

3. String Pull

This activity requires that 10 children sit on a chair in 1 line and 10 other children sit in chairs opposite them in another line, facing each other. One child takes the end of the rope. Then the other child who is not masked, starts pulling the rope slowly through the masked child's hands. There are knots all along the rope.

As the child who is masked feels the knots, he then stomps one foot on the floor to show that he feels the knot. After the rope is pulled clear through, the other child gets a chance.



Tactile - Temporality - Friday

4. Catch The Snow Flake

This activity is done by seating all the children in a circle, masked. The teacher is on the inside of the circle with a box of cereal. She then proceeds to have the children hold their hands out cupped--because she is going to drop "snowflakes" into their hands--and they are to count the snowflakes as they fall into their hands. You may drop from 1-4 snowflakes in each hand and also go back and drop more in the hands of those who only get 1 or 2 because at the end they may eat the cereal.

Auditory - Mobility - Monday

1. Marching

This activity is done by first masking the children, then lining them up. Instructions may be given first so that they will know what to do. Tell them to stand still, then when they hear the whistle, they are to go forward until they hear the bell--then they go backward. They keep going backward until they hear the clicker--then they go sideways. (They can turn sideways but stay in the same line.) You can alternate the pattern of when you ring the clicker, bell or whistle.

Do this for about 10 minutes.

Auditory - Mobility - Monday

2. Follow the Leader

Have all the children lined up and masked and tell them you are going to be their leader and they are to do what you do. Tell them to listen to how your feet are walking. You shuffle your feet loudly, so that they can hear. Walk in a snake-like fashion around the room. Encourage the children to walk as you do. You may have groups of 8-10 if it is more convenient.

Auditory - Mobility - Monday

3. Sound Interpretation

Have small groups for this activity. Have the children masked and tell them you are going to make some sounds and they are to then show you what they think the sound is for. Don't comment on their responses other than saying that "it is fine."

a. You make the sound of a motor (car or airplane) and ask them to show you what it sounds like.

b. Choo-choo sound

c. Running sound (make sound by running in same spot--insist that the pupil demonstrate and not just verbalize.)

d. Dropping sound--"Listen carefully to this sound and show me what you would do." You drop a book or block and hopefully they will reach down to pick it up.

e. Grunting and groaning--make this sound as though pushing or pulling or fighting.

Auditory - Directionality - Tuesday

1. Directional Determination

   a. Have pupils organized in groups with clickers. Have several circles. Each child in the circle has a clicker. Then place a masked child in the center of each circle. Then as you tell the child in the outer circle to click, the child in the center is to listen closely for the click and then find the child who did the clicking by walking over to him.

   b. Another similar group, using same procedures, only have the centered masked pupil point to source of sound.

   c. Another similar group, using same procedure, only having the centered masked pupil describe the location verbally (the best he is able--encourage him to identify it by--"near the door", "near the window", etc.)

Auditory - Directionality - Tuesday

2. Directional Patterns

   a. Divide class into 2 groups. Mask 1 group and give clickers to other group. Direct the clicker group to click 1 right after the other in tandem fashion, then when the last 1 has clicked, ask the masked group which way clicks went. Repeat sequence several times in both left-right and right-left directions.

   b. Then form circle with clicker groups and have them click counter-clockwise, then clockwise, and ask masked group in center which way clicks are going.

   c. Use same division of class into 2 groups. Have clicker group vary their heights with some sitting on the floor and some standing on chairs. Have masked group indicate whether sound was up or down.

Auditory - Spatiality - Wednesday

1. Spatial Determination

Mask 1 line of children, using half the class. Then take the remaining children and give each one an implement of sound (such as a bell, triangle, whistle, etc.) Then place them at different distances from the masked line of children. Then tell the masked children that they are to listen closely to the sounds and to tell you which sound is farther away and which one is closer. Then you tap the child on the shoulder who is to make the sound so that the masked child will not relate to name calling. Then ask a specific masked child which sounds were farther away or closest. Reverse groups after you've given each masked child a chance.

Auditory - Spatiality - Wednesday

2. Positioning

a. Mask and group as convenient. Tell them what the sounds are going to be made by. Then after you make a set of sounds--ask them which sound came first:

- i. bell-click
- ii. drum--ruler on table
- iii. paper crumpling--book dropping on desk
- iv. soft whistle--bell
- v. click--drum

Vary any manner you wish and continue as much as you have time for or until pupils seem able to identify the first position.

b. Last position-

Do same sounds as above only ask children only to identify the last sound that they hear.

c. Middle Position-

Same as above only identify middle sound.

Auditory - Differentiation - Thursday

1. Identification of Sounds

   Group your pupils as conveniently as possible. Mask all of them.

   a. First, present 2 different sounds:

      i. bell--click

         Ask pupils to verbally identify how many times it rang or clicked and what they were.

   b. Present 3 different sounds

      i. Paper crumpling

      ii. Finger snapping

      iii. Clap wooden blocks together

         Ask same questions after each one as in part 1.

   c. Present 4 different sounds

      i. Triangle

      ii. Soft whistle

      iii. Book closing or slamming

      iv. Water running in sink

   d. Present 5 different sounds

      i. Bongo drum

      ii. Knocking on wood

      iii. Chair moving

      iv. Ball bouncing

      v. Hand clap

Auditory - Differentiation - Thursday

2. Likenesses and Differences of Sounds

a. Group and mask pupils as convenient. Then you will do the following sounds and after each one--ask the children if they "sound alike or not alike".

i. Clicker versus paper crumpling
ii. Block dropped on table vs. ruler tapped on table
iii. Ruler vs. ruler
iv. Paper crumpling vs. paper crumpling
v. Clicker vs. bang on tin can
vi. Clicker vs. clicker
vii. Stapler vs. clicker

b. Musical sounds

i. Bongo drum vs. bell
ii. Triangle vs. bell
iii. Bongo vs. bongo
iv. Whistle vs. bell
v. Bell vs. bell
vi. Tambourine vs. bongo
vii. Tambourine vs. bell
viii. Tambourine vs. triangle
ix. Tambourine vs. tambourine

Auditory - Temporality - Friday

1. Auditory Patterns

Form groups as conveniently as possible and mask all of them. The level of training in this first step is simply to have the pupils repeat a short auditory pattern. They should all be provided with a rhythm band instrument. The teacher or an assistant can direct the masked group to listen carefully and repeat after her; if they tend to be impulsive and respond before hearing the stimuli, caution them to wait until you say "okay".

a. Begin with a single beat, and have them repeat it until most of the group do it. Gradually reduce the interval between beats until they are doing a whole note rhythm.

b. Next try a 2 beat rhythm. Approach it in a similar manner with the 2 beats separated by a rather long interval and gradually reduced until the 2 beats are a half note rhythm.

c. If successful, try a 3 beat rhythm with a gradual reduction of the interval until it is a type of rhythm (1-2-3-pause), still in moderate tempo or speed.

d. Try more if time and success permits--however, 10 minutes would probably be sufficient.

Auditory - Temporality - Friday

2. Repetition Patterns

Provide a jingle clog and a maraca for 15 children. Let the other 15 children do some other activity.

a. Begin with a simple alternation, first 1 hand then the other hand, gradually bringing it to a half note rhythm for each hand. The teacher shakes the instrument in her 1 hand, then pauses, then shakes the instrument in the other hand; then the children are to respond in the same manner. (Gradually shorten the pause).

b. After doing the 1 shake of the rhythm instrument with each hand, then do 2 shakes with each hand with a pause in between. Gradually shorten the pauses.

c. Now do 3 shakes with each hand.

Time limit is 10 minutes.

Be sure to mask the children.

Auditory - Temporality - Friday

3. Auditory Transmission

Group as convenient and mask. Form a circle in chairs and have the teacher start a pattern of her choice (preferable something simple). Have the next child repeat the pattern as he heard it and so forth around the circle. If pattern changes, as it undoubtedly will, let it continue as modified until it goes a full circle. Use single instruments with each pupil having 1. Instruct pupils to simply repeat what they hear when it's their turn.

Auditory - Temporality - Friday

4. Auditory Selectivity

Mask and group as usual. This may be rather difficult; however, if they are encouraged to try it, it will provide some challenge to auditory perception and response.

Teacher has a drum on 1 side of her so that she can beat it, and a clicker in the other hand. All 30 children may do this at 1 time. Give each child an instrument, either a maraca or a jingle clog. The pupils are instructed to respond by shaking their instrument only when they hear the clicker, and remind them that they have to listen very carefully. Start with a simple pattern of widely separated beats. First beat the drum once, then pause, then click the clicker. Wait for the childrens' response. Then gradually shorten the pause interval and increase the number of beats with each hand.

Suggested patterns:

a. Maraca--pause--click

(Stay on this pattern until they seem to catch the idea).

b. Maraca--pause--maraca--click

c. Maraca--maraca--maraca--pause--click

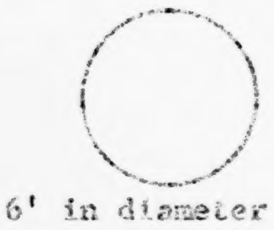
d. Maraca--pause--click--click

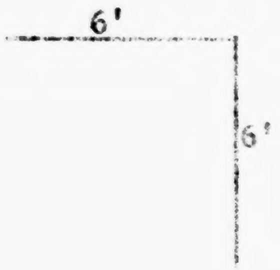
Visual - Mobility - Monday

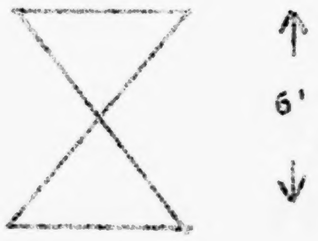
1. The basic idea of this section is to train for transposing of a visual pattern into movement.

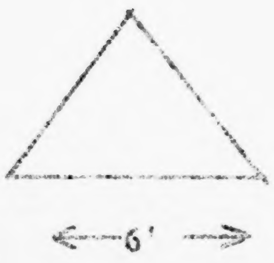
   Two stage process:

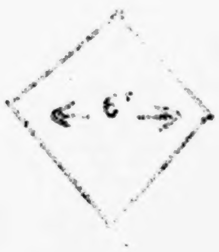
   a. Draw a chalk line or masking tape on floor to have pupils walk along. Have pupils form a line and let them proceed walking over or along side these figures. The larger the figures the better--6 feet would be ideal. This is primarily an introduction or orientation. It shouldn't be difficult.











   b. After the above orientation, draw the same figures on the chalkboard. Have the pupils walk according to the figure. Don't specify the size; let them first interpret how they are going to do it. After their first trial, encourage them to do them bigger--as large as they can within the space available. Then draw the figure again only smaller on the blackboard and see if they will reduce the size of the figure they walk. If they fail to make any change according to the smaller visual pattern, ask them to look carefully at the drawing and tell if it is bigger or smaller than the last one. This can perhaps be best accomplished with groups of 8-10. Do as many of the figures as time permits. It may be easier to do 1 or 2 at a time.

Visual - Directionality - Tuesday

1. There are 2 important aspects to directionality training; 1 is eye movement and the other is directional interpretation visually.

   a. Eye movement activities

   The pupils will need to work in pairs. Have 1 pupil stand on a chair and swing in a pendulum fashion an embroidery hoop on the end of a string. The other pupil will try to put his finger through the hoop. They may try to stop or grab it. Encourage them to get their finger in and out without stopping the swing of the pendulum. Variation of this is the speed of the swing. Start out slow, then increase. It is also good to vary the height and angle of the swing. For example, start with swing going directly across and in front of the child. Then gradually change position until swing goes perpendicular to child. He then could try to have his 2 index fingers meet through the hoop while it is swinging to and from him.

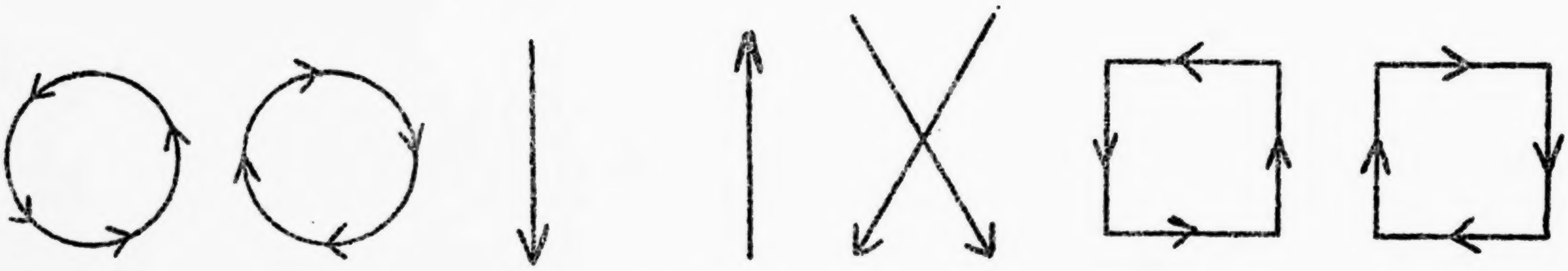
   b. Visual push-up

   Have pupil hold stick directly under his nose with string held out in front of him by other pupil. The pupils are sitting face to face about 20" apart. Then have the pupil holding a string with a bead on the end of it, push the bead slowly to the nose of the other child, all the while keeping the string taut. Do not let the child repeat this more than 4 or 5 times to begin with. This activity creates visual fatigue rather easily.

Visual - Directionality - Tuesday

c. Visual pursuit (at near point)

Have 2 pupils work as a pair. They will be seated facing each other, 4-6 feet apart. One child will have a wand with a star on the end of it. Have him move it slowly so the other child can visually follow the movement. Have each child move the wand in roughly the following patterns:



Remind the child not to move his head, just his eyes. Have pupil cover 1 eye with hand, then switch to the other eye, then both together. Have the pupils do this for about 10 times, or 3 times with the right eye, 3 with the left and 4 with both eyes. Then switch partners.

d. Visual pursuit (far point)

Do the same as in c. only at a distance of 8-12 feet.

Visual - Directionality - Tuesday

2. Directionality Interpretation

This section is simply to give pupils some direct experience with body crossover and reversed body imitation type of directionality.

This can be done with whole or half class at a time, whichever is more convenient.

Place a piece of bright yellow tape on the back of each pupil's right hand only. Teacher or leader do the same. Direct the group in a series of imitating movement. You are teaching them to discriminate which hand is doing what. In facing the group, the direction is reversed. They may not master this idea, but at least can have some experience trying to coordinate their directions with the teacher. Whenever necessary, remind them to check their yellow taped hand with the teacher's. Have them use the same hand as the teacher did.

Suggested movements to direct:

a. Start with simple right arm positions--out, up, down, front

b. Next the other (left, unmarked hand)

c. Next both hands moving together through same series of directions (positions)

d. Next make grossly different position with right and left arms, one up - one down, one front - one sideways, one back - one front, etc.

(If they seem to be following accurately, go to next stage)

e. Right hand to left knee

f. Right hand to right ear

g. Left hand to left eye

h. Left hand to left knee

i. Right hand to left ear

j. Right hand to left eye

k. Left hand to right eye

l. Left hand to right ear

m. Vary the crossover pattern as time and talent permits.

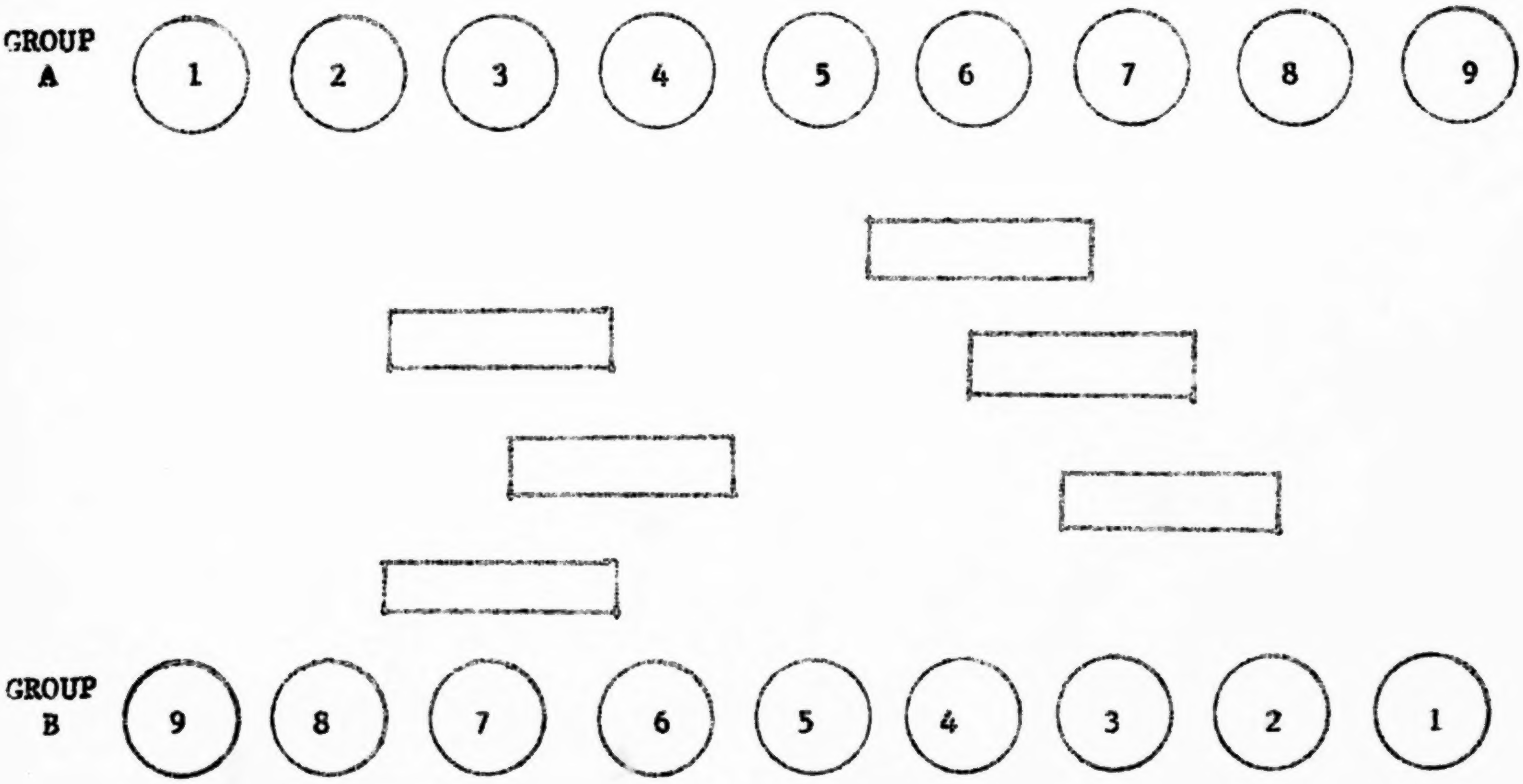
Visual - Spatiality - Wednesday

The major purpose is to train for perception of distance, shape, and comparative space requirements.

1. Distance perception

   a. Finding the shortest way.

   Line up 2 groups of 8-10 with each having a small card with a number on it. The numbers range from 1-9.

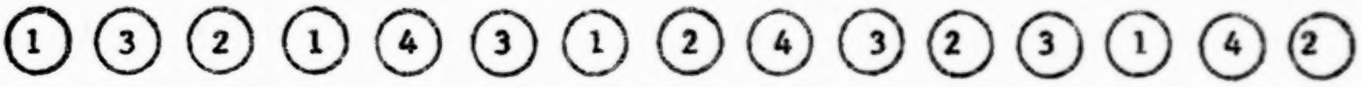


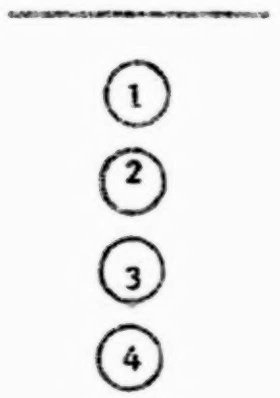
Have the pupils find their matching number, with the instruction for them to find the shortest way through the tables. Start off by holding up a number and the pupil from 1 side, whom you designate, holds up the same number. Then ask the 1 that has the same number on the other side to hold his number up. Then have the first child find the shortest way over to the other child with the same number. After he has done this, ask him if he went the shortest way. It's not necessary to affirm or correct the response, but to simply ask the question and let them evaluate the distance on their own. Continue the procedure until 1 group has finished; then let the other group do the same.

The tables can be varied in several ways and the distance varied according to the pupil's response. If too easy put in more tables or chairs, if too hard take some out.

b. Find the 1 who is far away.

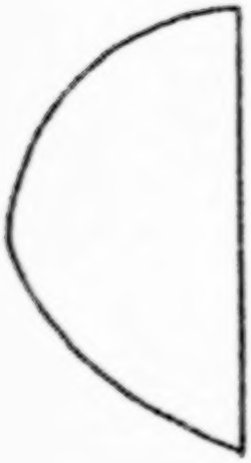
The balance of the class can be doing a similar type of distance judging. Have all but 4 pupils line up in a row--each having a card with a number (1-2-3-4).





Call number 1 and all of the people with number 1 hold their card up. The pupil who is in the group of 4 pupils selects the pupil in the line that is farthest away and changes places with him. You can ask the group if he went to the 1 that was farthest away. Rotate the pupils until everyone has had a turn

Visual - Spatiality - Wednesday



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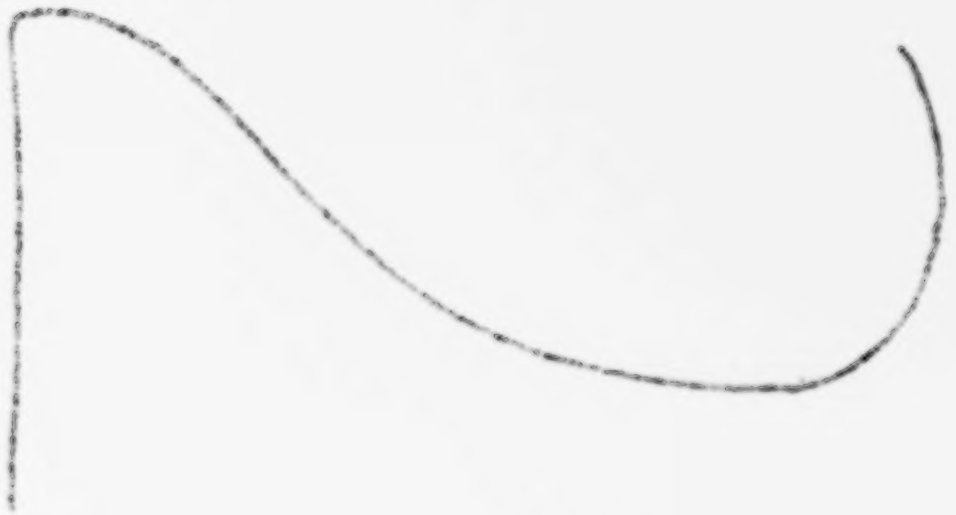
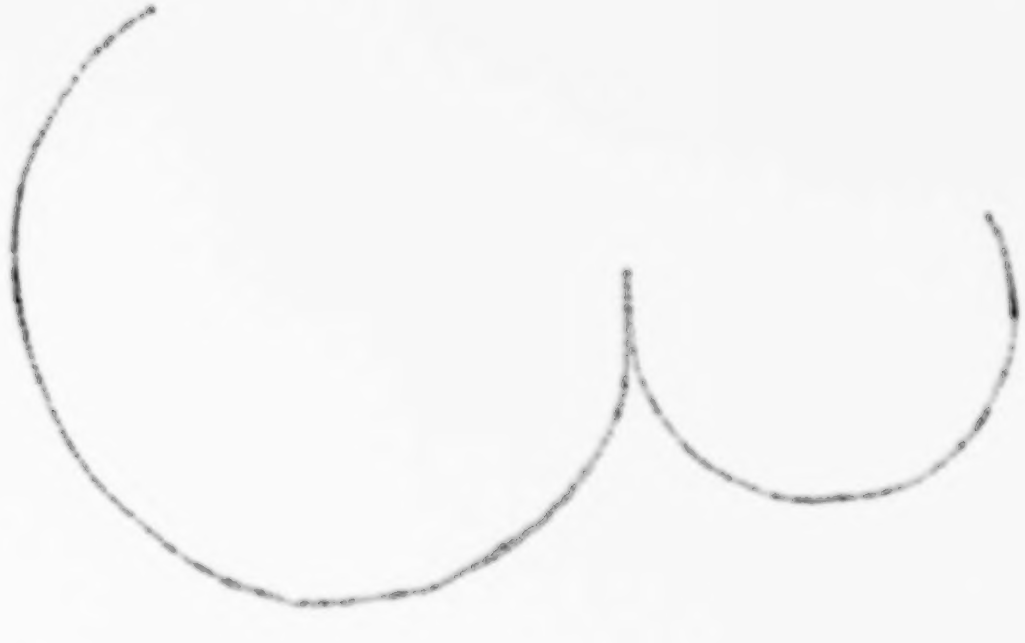
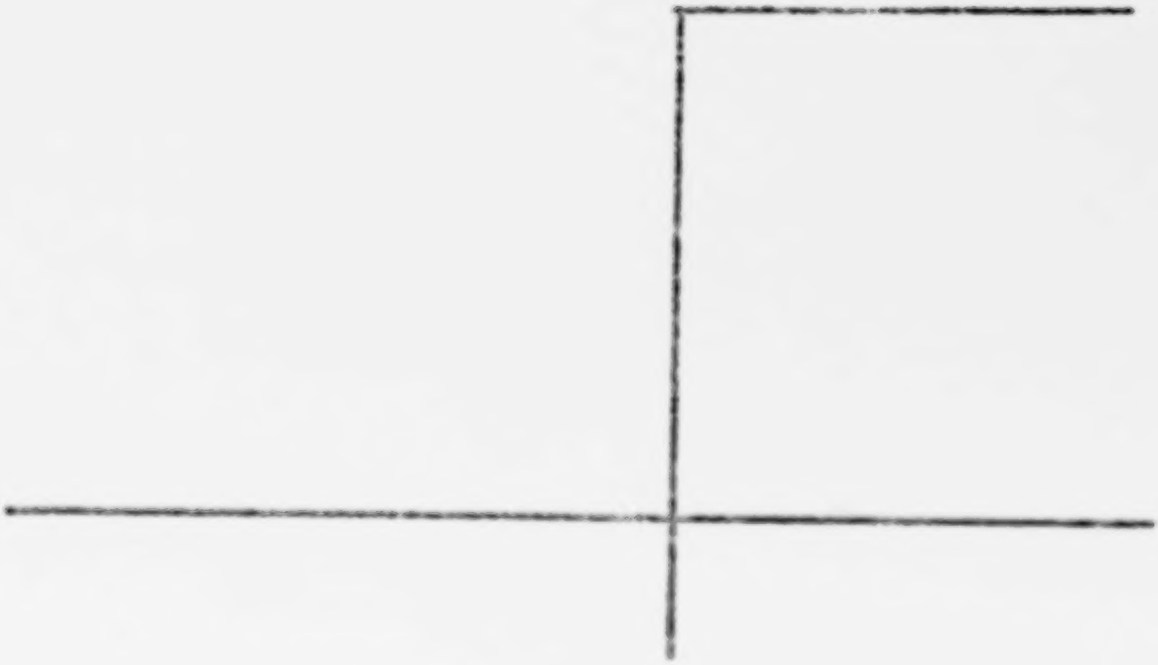
Visual - Spatiality - Wednesday

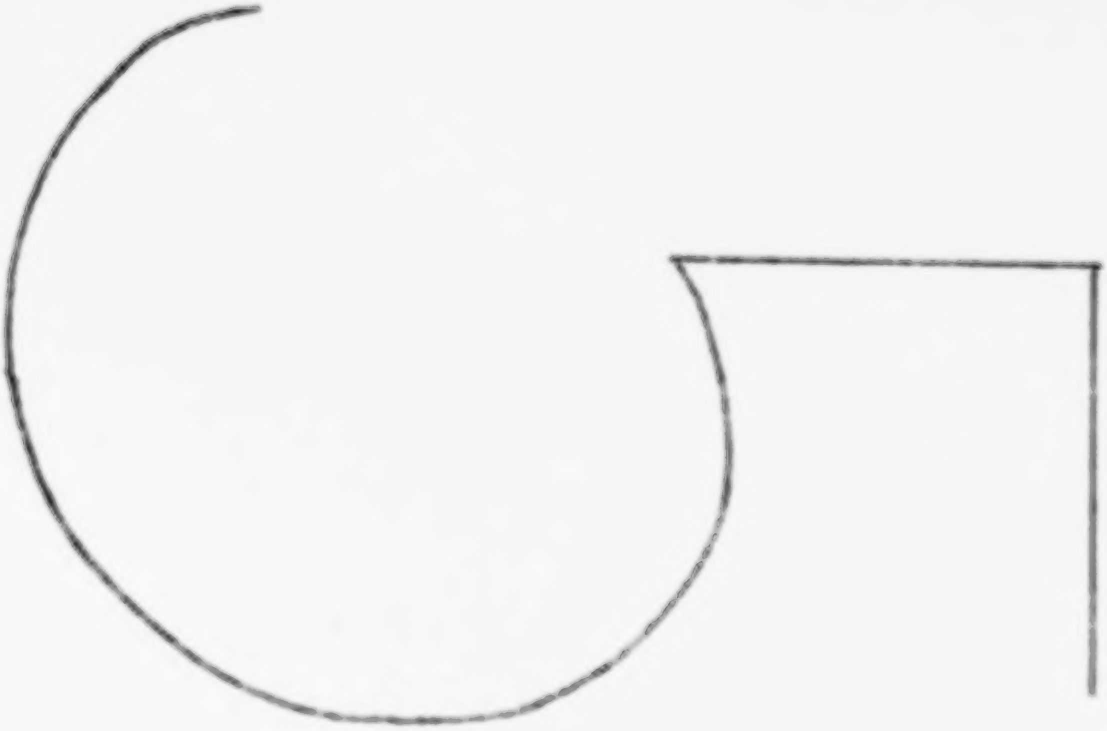




EIII

Visual - Spatiality - Wednesday





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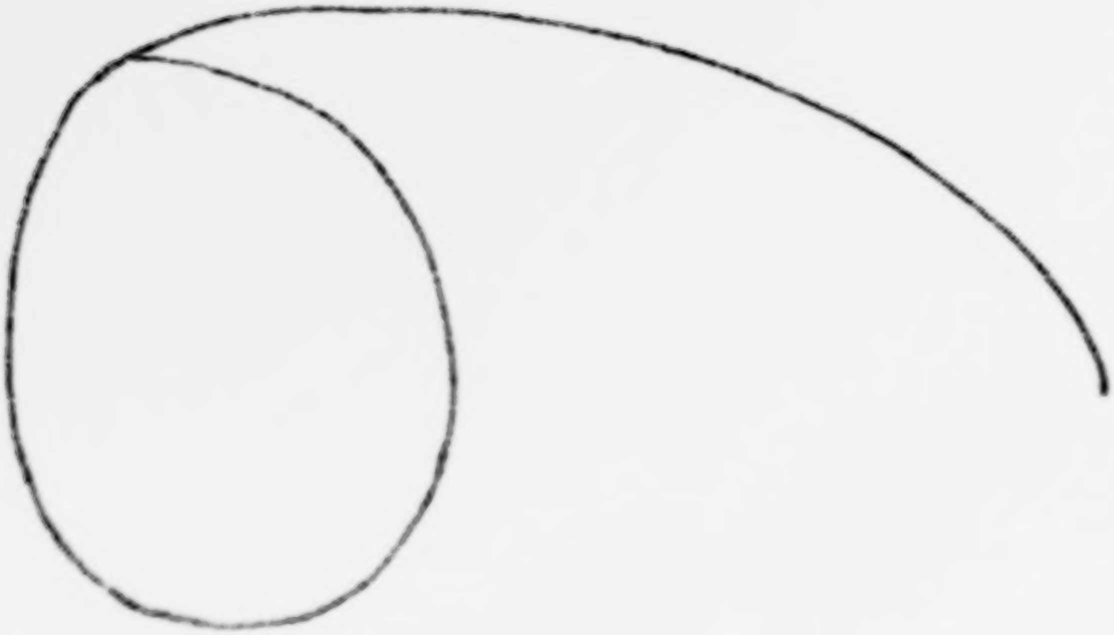
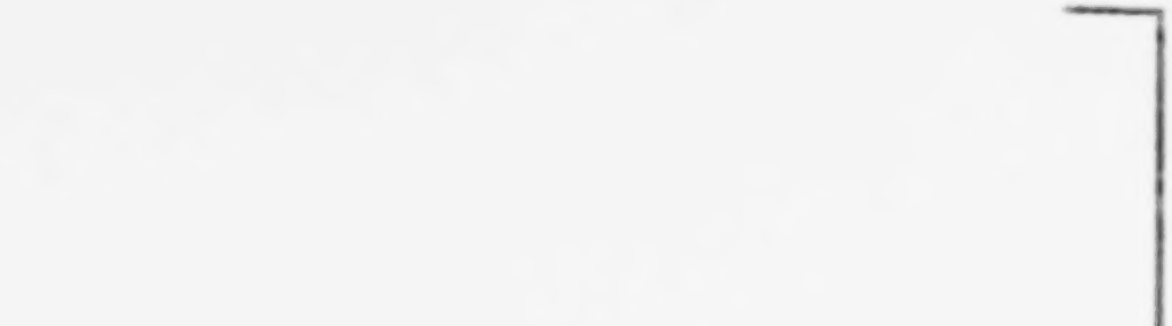
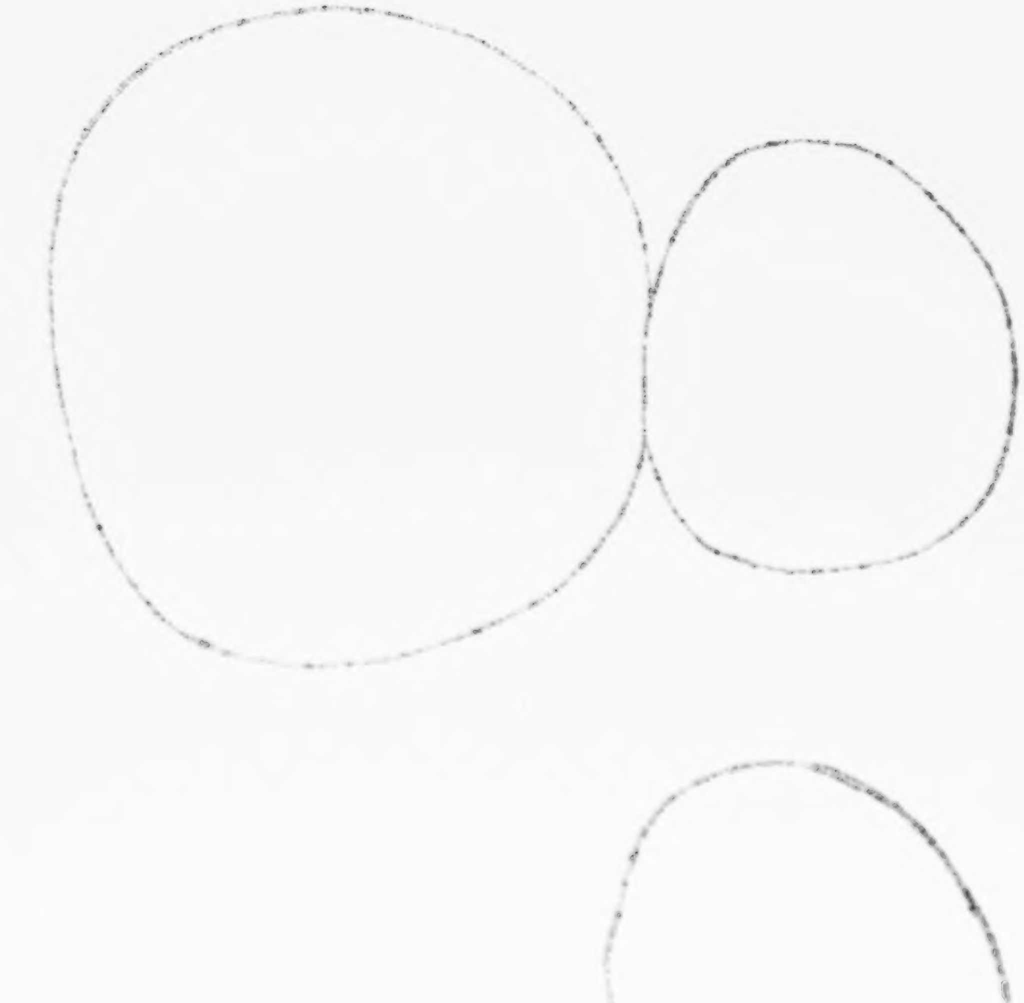
Visual - Spatiality - Wednesday





Visual-Spatiality -Wednesday

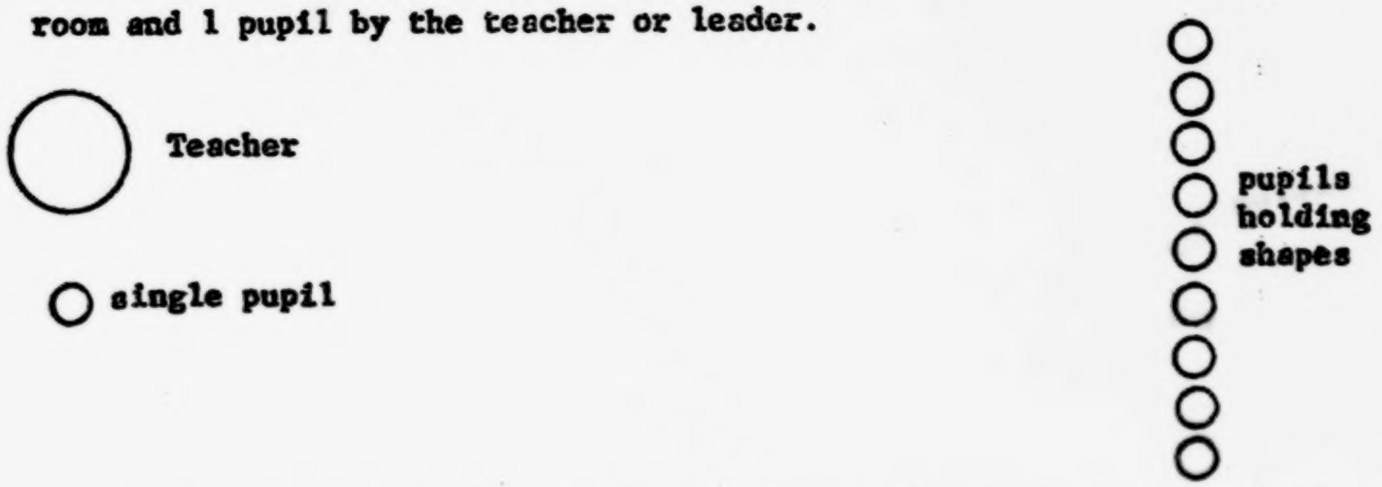


Visual - Spatiality - Wednesday

2. Matching shape and size perception

a. Find the same drawing

Group the children by 10's. Have 9 in a row at 1 end of the room and 1 pupil by the teacher or leader.



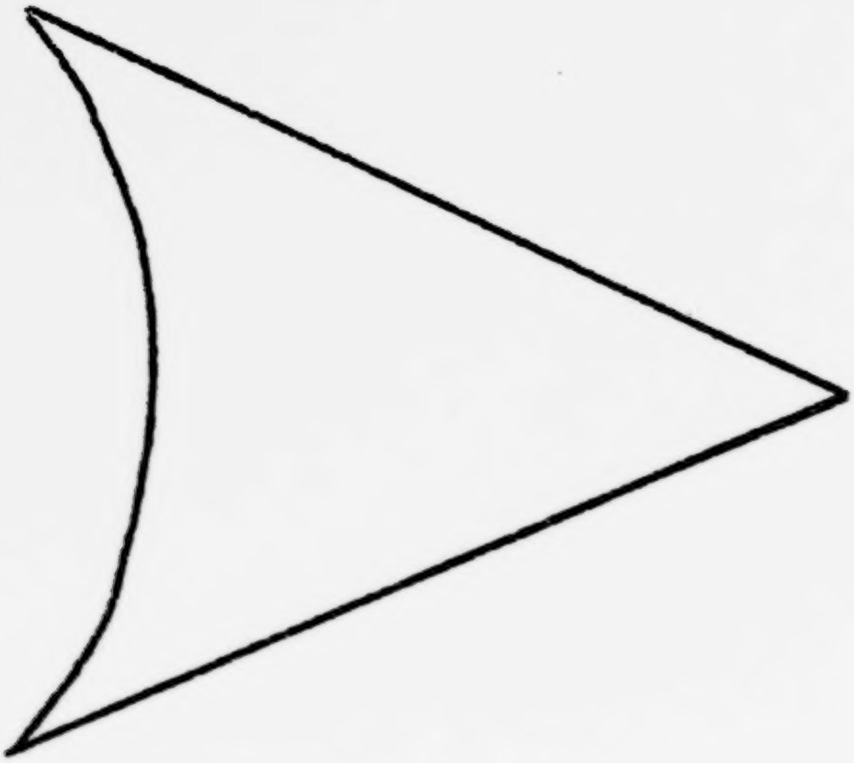
Each of the 9 pupils have 1 of 3 shapes of different sizes. The teacher has a similar stack of drawings and selects 1 for the single pupil to inspect and then go and replace the pupil who has the same kind and size. Do not let the pupil take a copy of the design with him. See if he can keep the image of the shape and size he wants across the room.

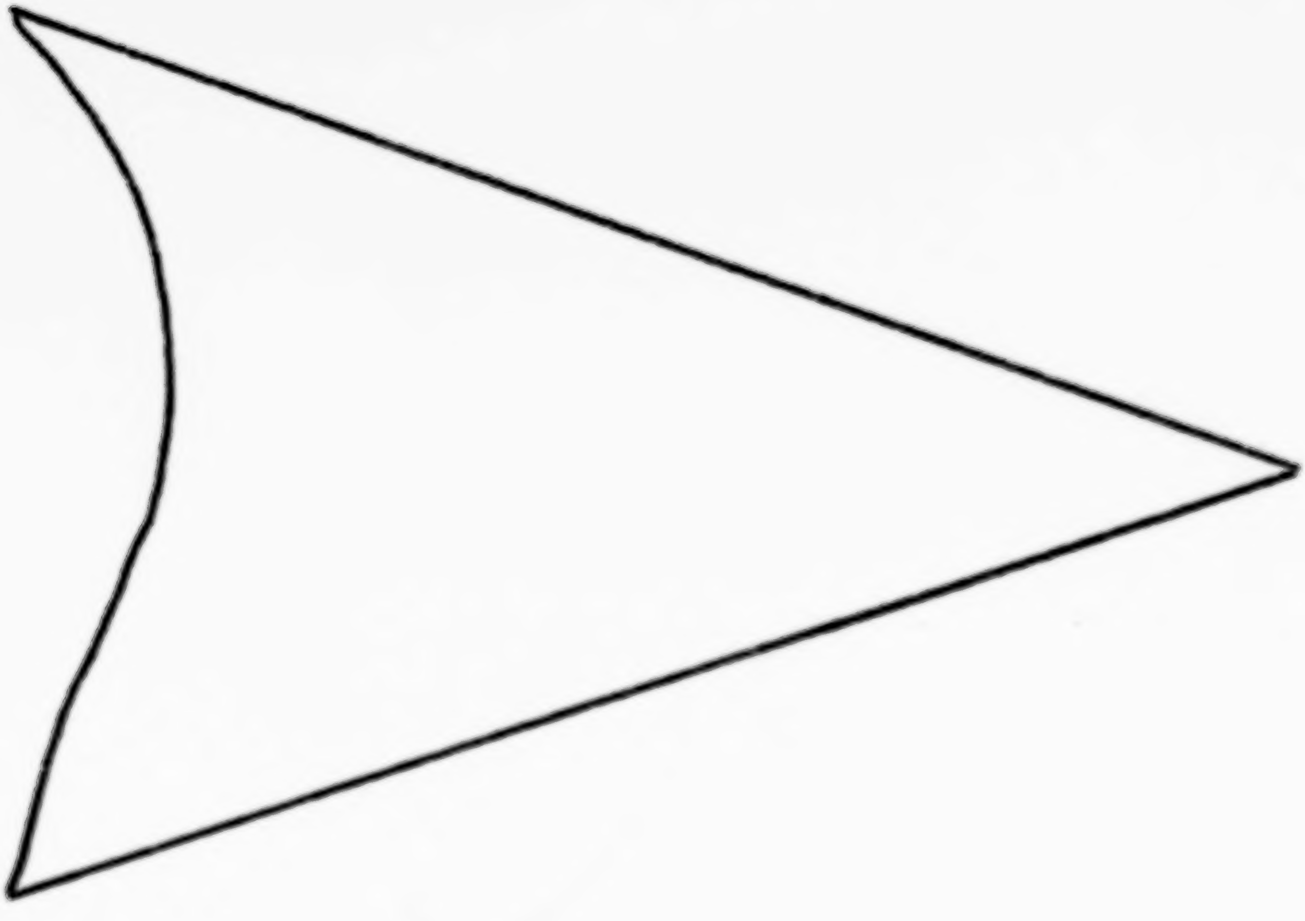
b. Find the right size

Start with a group of 8 or 10. Take the 6 different sizes of paper bags and line them up. Then take 6 more and make another line several feet away. The paper bags are to be sitting up and open. Then give the pupil an object (coffee can, kleenex box, ball, block of wood, etc.--any object not larger than the largest sack). Have the pupil find the sack that is just the right size, not too large and not too small. Have the next pupil find the sack that just fits over his hand, or foot, or his head or that he can stand in.

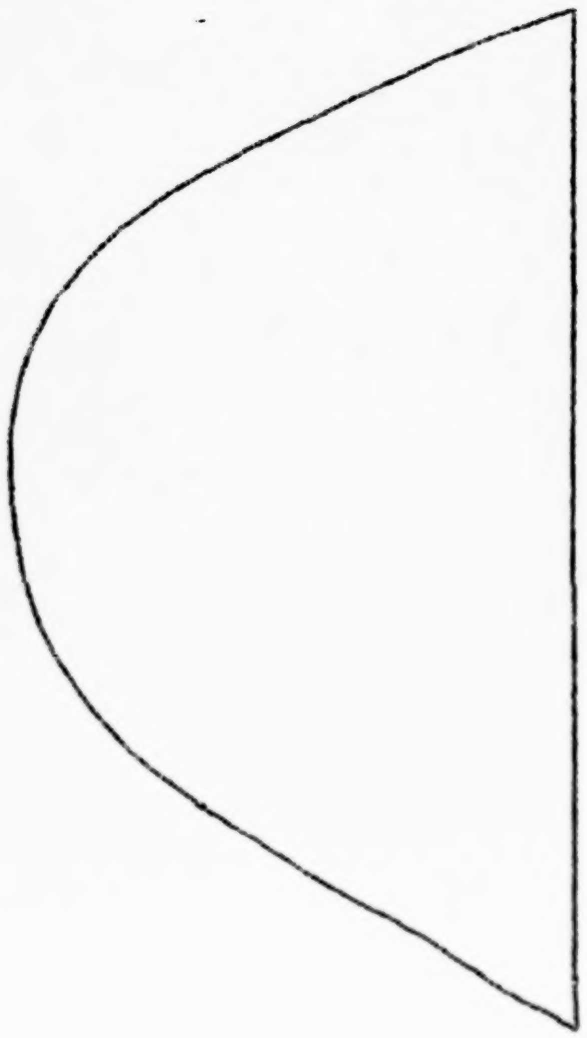
EIII

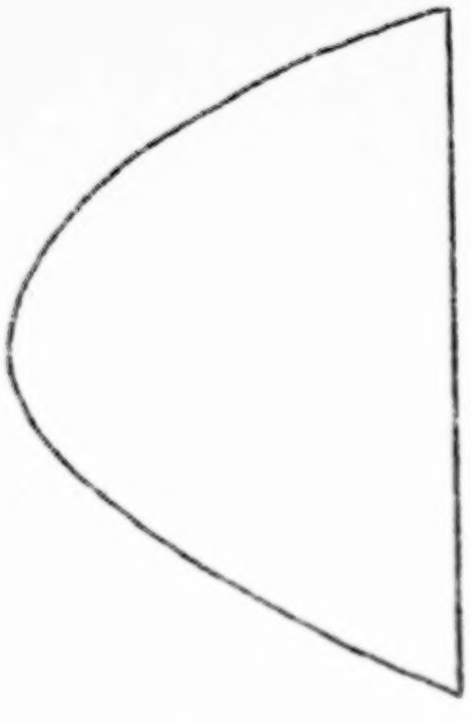
Visual - Spaciality - Wednesday





Visual - Spatiality - Wednesday

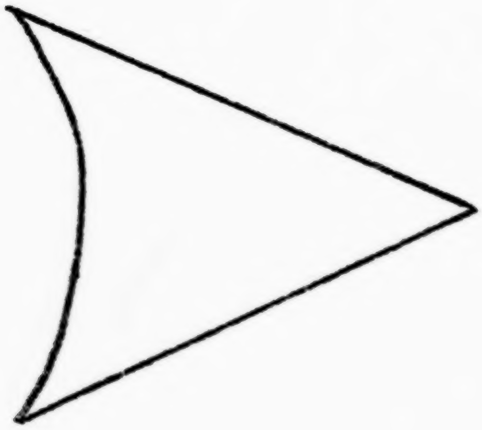




Visual - Spatiality - Wednesday

EIJI

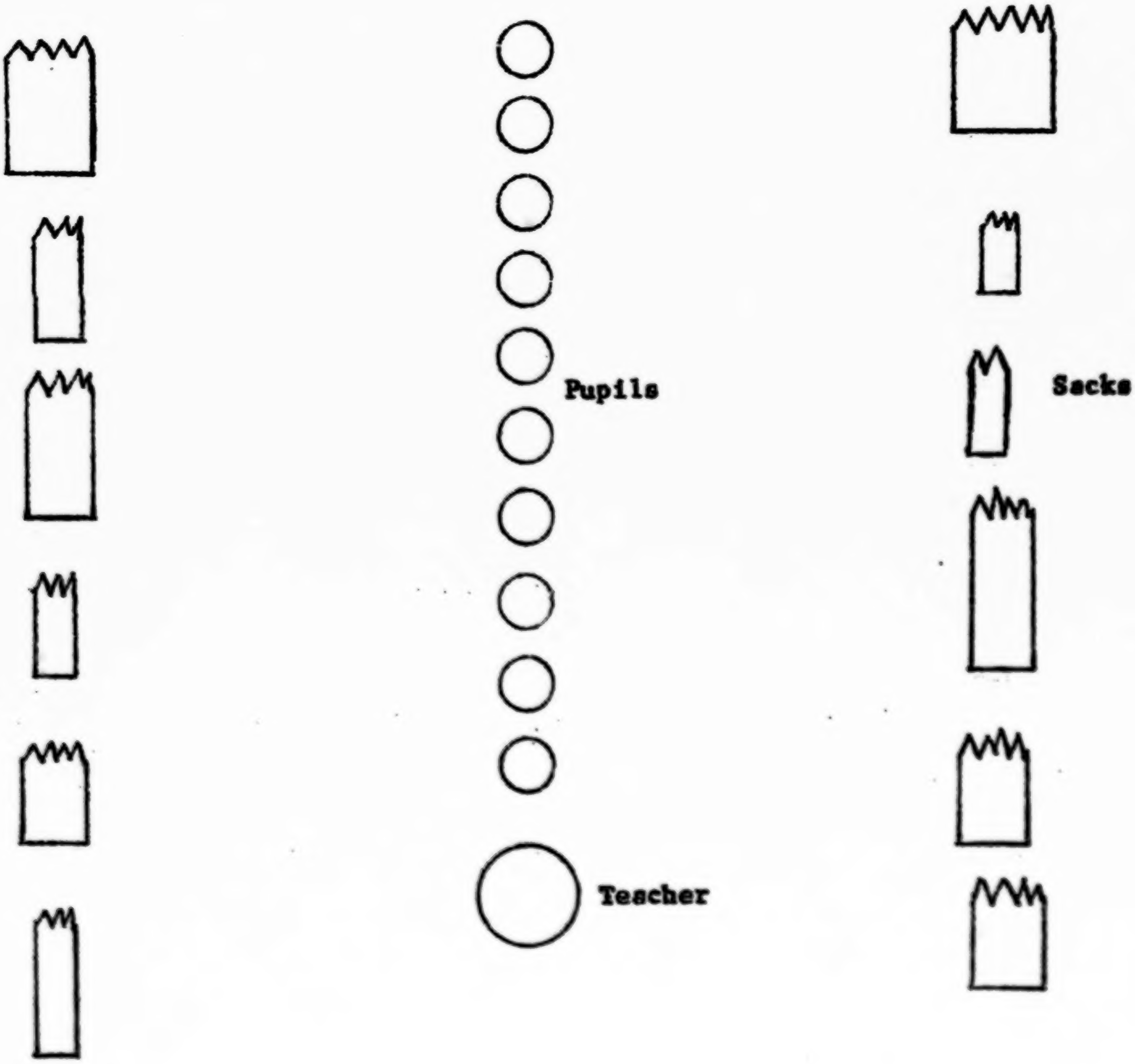
Visual - Spatiality - Wednesday



EIII

Visual - Spatiality - Wednesday

Alternate the object and body part as you go through the line of pupils. Have them find or select the bag before trying it and show you before putting object in or trying it on.



Visual - Differentiation - Thursday

The primary purpose here is to train for the sorting out and matching type of perceptions.

1. Sorting Out

   a. Object sorting

   A suggestive grouping could be 2 tables with 4-6 pupils per table, each pupil having a cupcake pan with 6 compartments, and central box or bag of materials containing:

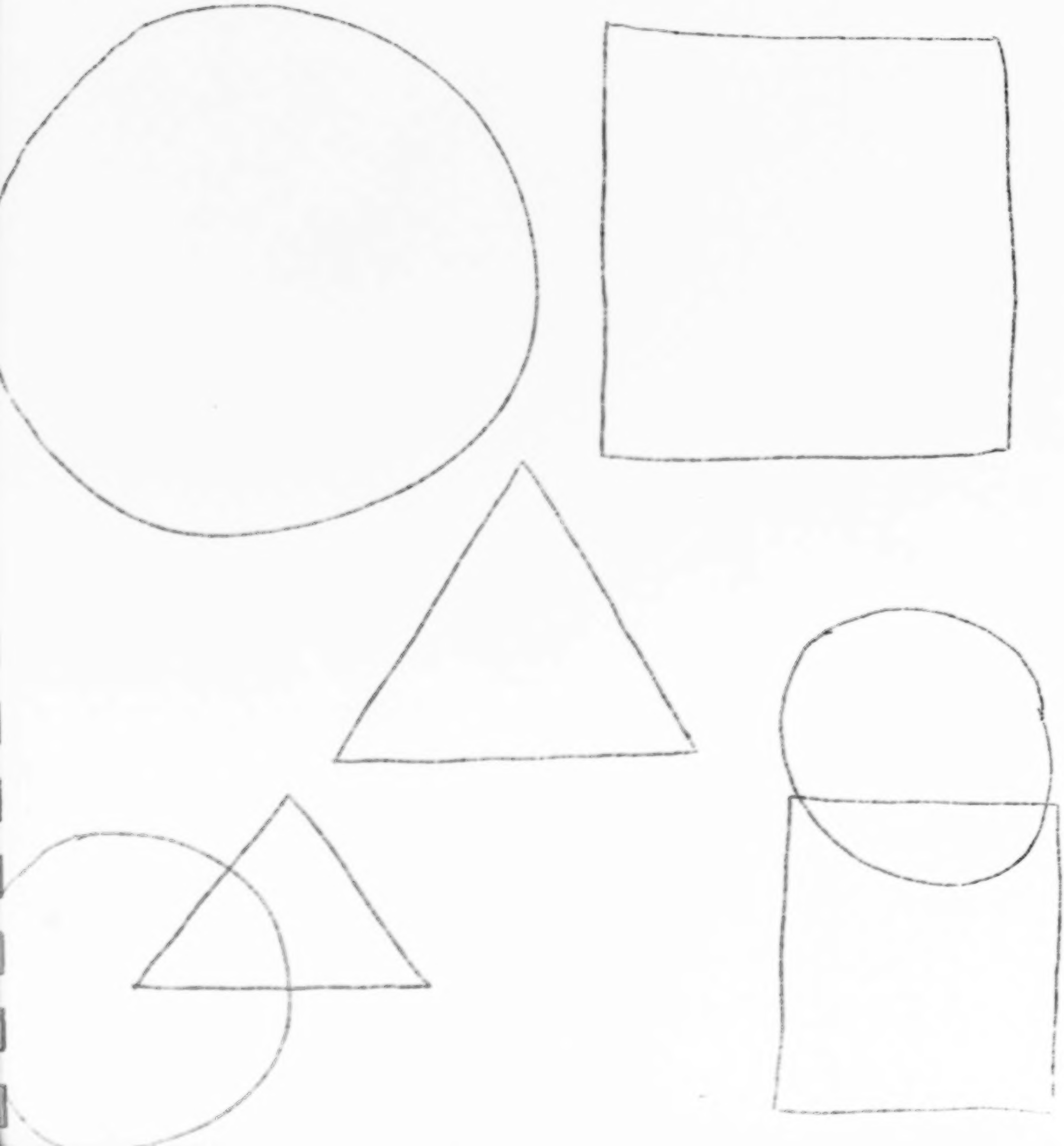
   1. Play coins
   2. Various sizes and colors of marbles
   3. Various colors and sizes of buttons
   4. Various sizes and colors of beads
   5. Various sizes and shapes of nuts and bolts
   6. Various miscellaneous objects, such as safety pins, paper clips, hair pins, nails.

   The pupils are told to sort out all of the same kinds of things--all the money, or marbles, or buttons.

   Then to sort all of the same things into the different colors, sizes, or shapes.

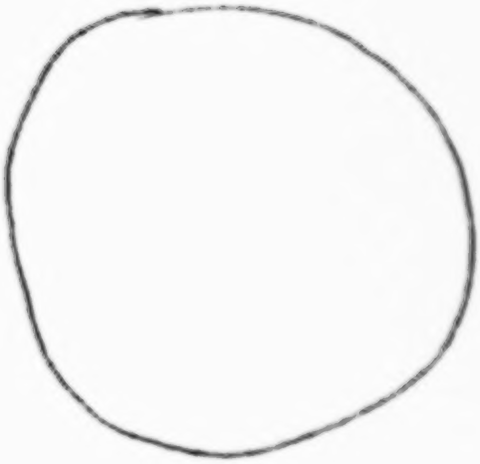
   Permit them to do it on their own to begin with, then guide their selecting process only as much as is needed.

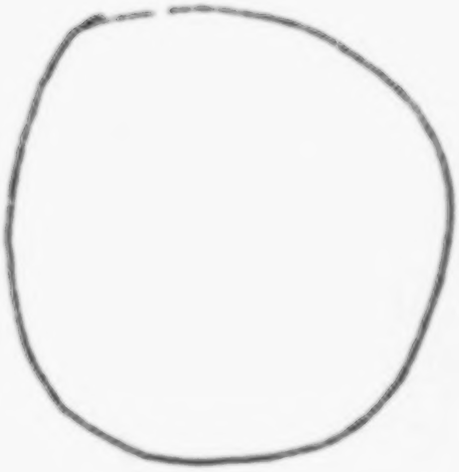
Visual-Differentiation -Thursday

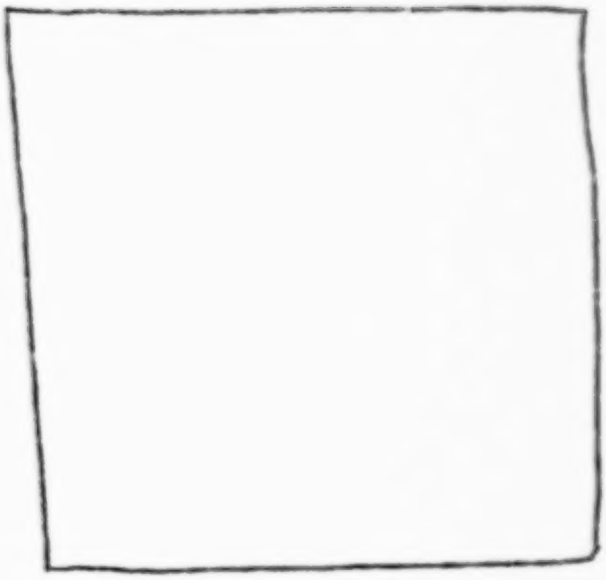


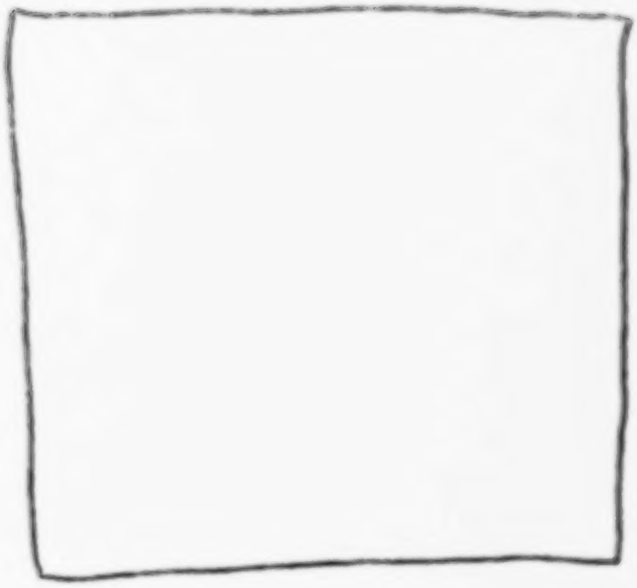
EIV

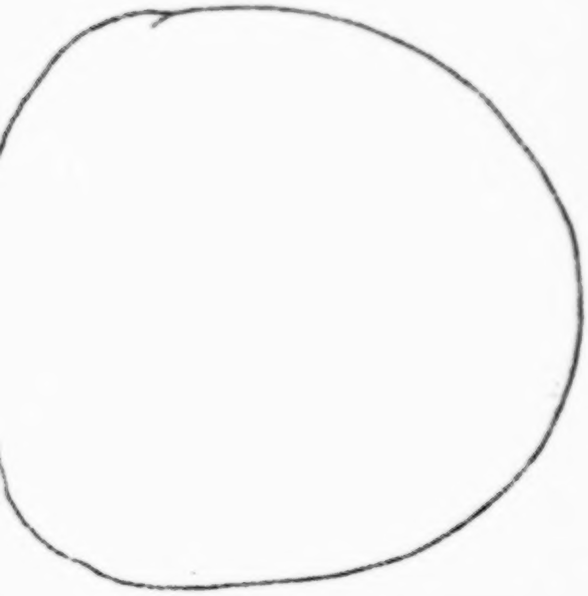
Visual - Differentiation - Thursday

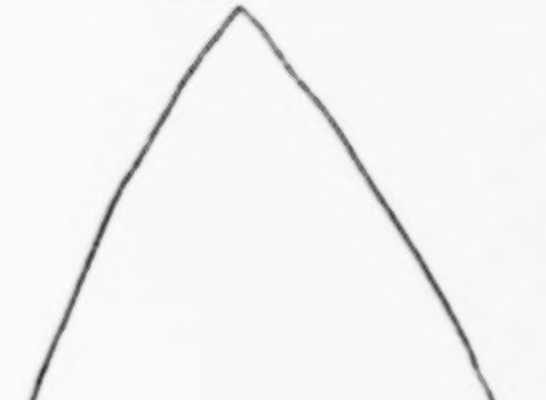


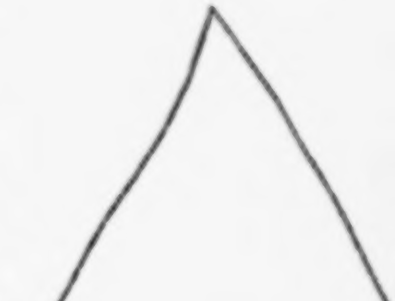












Visual - Differentiation - Thursday

b. Symbol sorting

A similar grouping arrangement--2 tables with 4-6 pupils per table, each pupil with a cupcake tin, and a central supply of materials containing:

1. Small cards with circles, squares, crosses, triangles, diamonds, hexagons.
2. Small cards with numbers from 0-9
3. Small cards with various letters--A,B,C,D,E,F,G.

Pupils are told to sort out 1 of the 3 kinds of symbols--either numbers, letters or figures.

Then find all of the same kind for 1 compartment in the tin. For example, all of the A's or O's or X's etc.

Visual - Differentiation - Thursday

2. Cut, Paste, and Match

Group the children with 4 to a table. Provide each table with some paste. Each pupil is given a ditto sheet with the figures overlapping and another ditto of the same kinds of figures that they are to cut out and to paste on to the first ditto.

XIV

Visual - Differentiation - Thursday

6	5	3	1	0
7	5	3	2	0
7	5	4	2	0
7	6	4	2	1
8	6	4	3	1

Visual - Temporality - Friday

The primary purpose is to train in the perception of sequences and patterns, and to visually put things in their proper temporal order.

1. Group Assembly

a. Number Assembly

A group of 4 at a table. Have 2 tables at 1 time. Each table will be provided with a paper that has numbers around the edge. Then provide each child with 3 numbers each, randomly selected. Put 2 staplers on the table. Then the teacher takes her set of numbers, and starts with number 1 and holds it up and asks the children to see who has the number 1. The child who has it then takes the piece of paper that has numbers around the edge, finds the number 1 on it, then staples his number 1 over the top of it. Then the teacher holds up number 2 and asks who has number 2. The child who has number 2 then gets to staple his number on. You continue until all the children's numbers are used. This helps them to work as a group in finding who has the next number and sharing the paper and stapler.

b. Object arranging

Using the 4 to a table again, provide each pupil with a part of a house, tree, and car. Each table is also provided with the ditto that has the picture of a house, tree, and car. Start with the ditto of the house, and ask the children to pass the ditto and when it comes their turn to staple their part of the picture where it is supposed to go. After the house is finished, go to the tree and car.

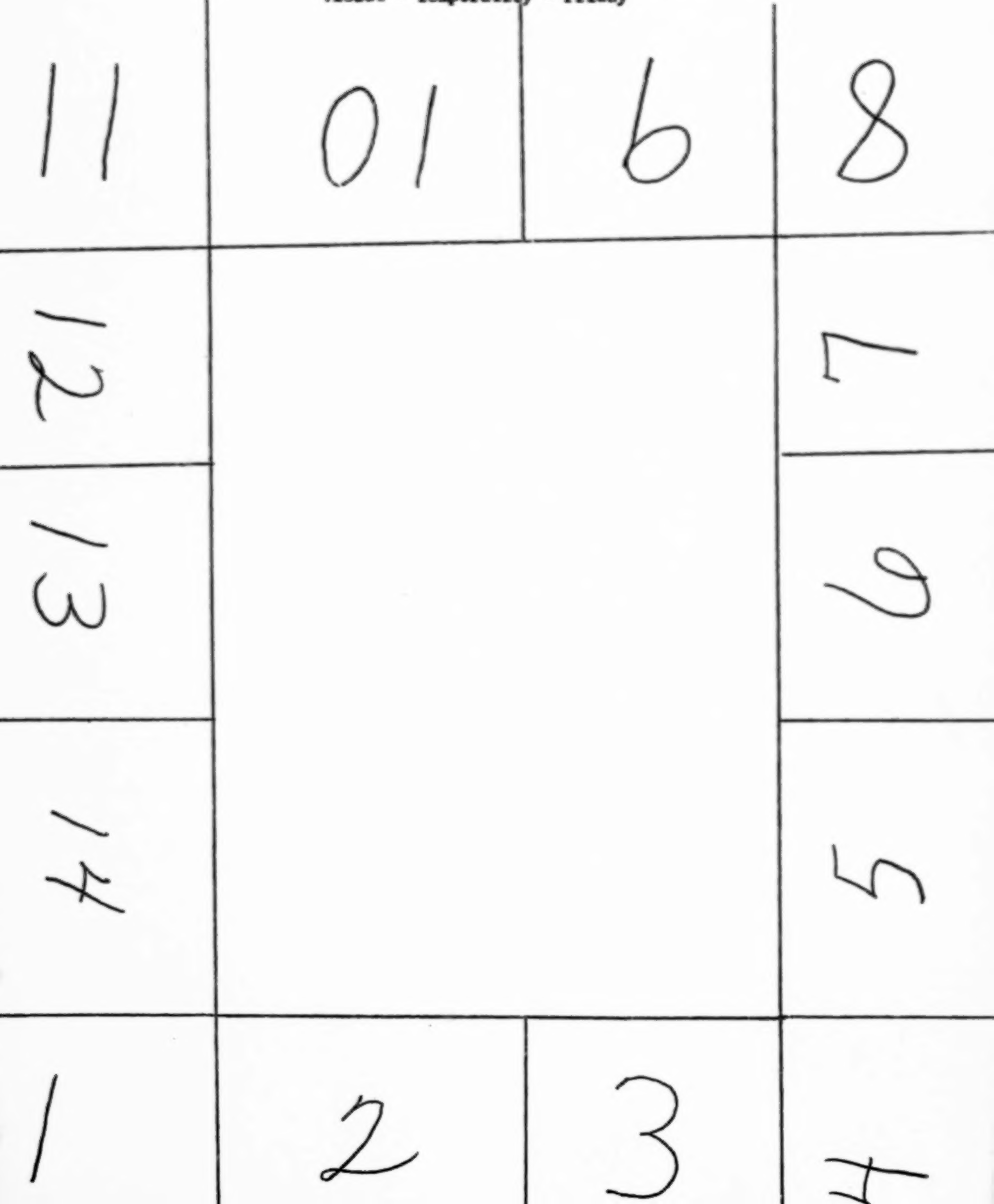
Visual - Temporality - Friday

2. Pattern Watching

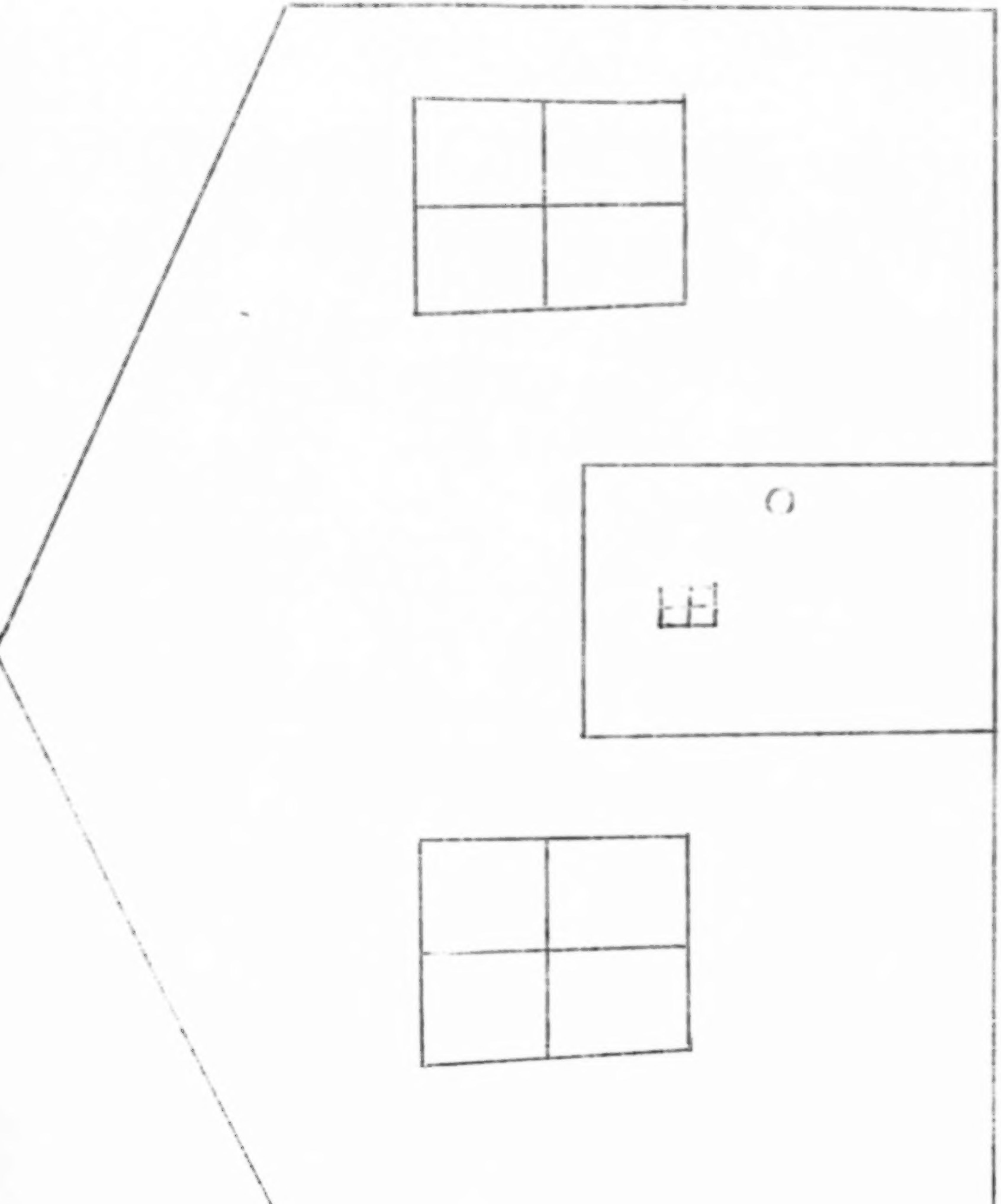
Group in any manner that is convenient. Can be done as a total class. Provide each pupil with the ditto that has rows of shapes, a ditto that has numbers, and a ditto that has letters on it. Have the small individual staplers available. Each child is to also have a set of the strips of ditto that are already cut. They then are to staple the strips on to the ditto where they are to go. They may either staple or paste the strips, whichever is convenient. If you can let them staple though, do so.

EV

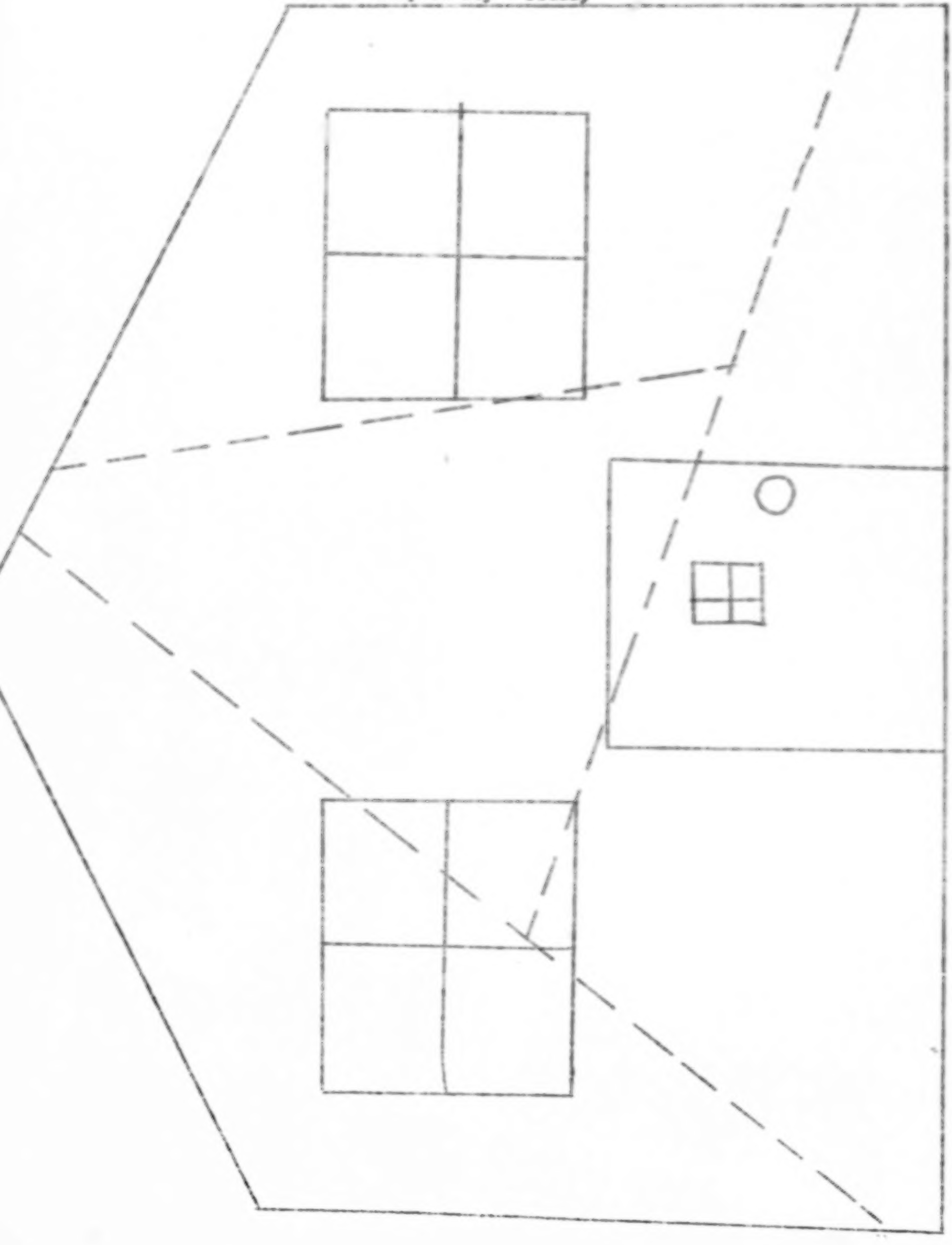
Visual - Temporality - Friday


11
10
9
8
12
7
13
6
14
5
1
2
3
4

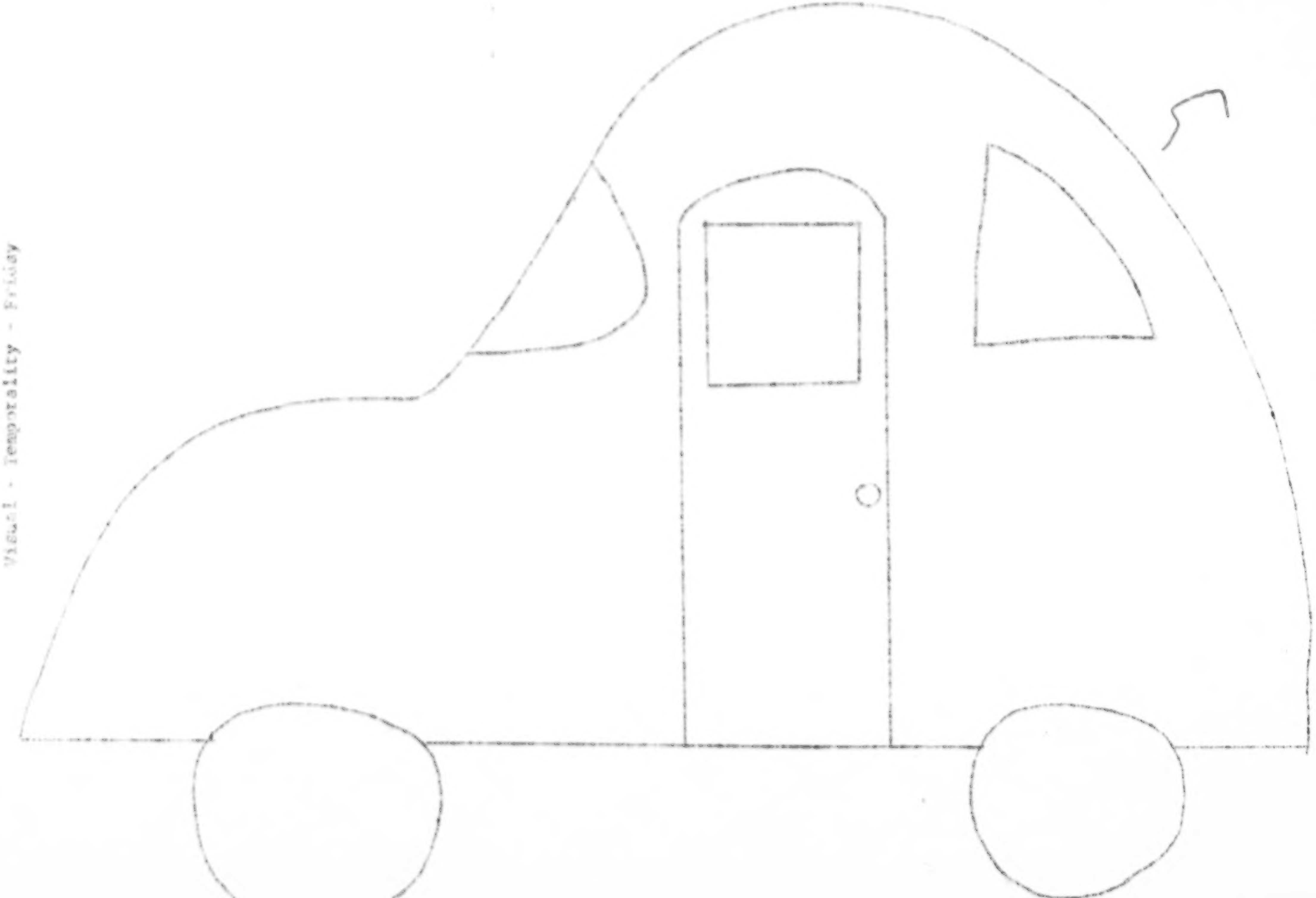
Visual - Temporality - Friday



Visual - Temporality - Friday



Visual - Temporality - Friday



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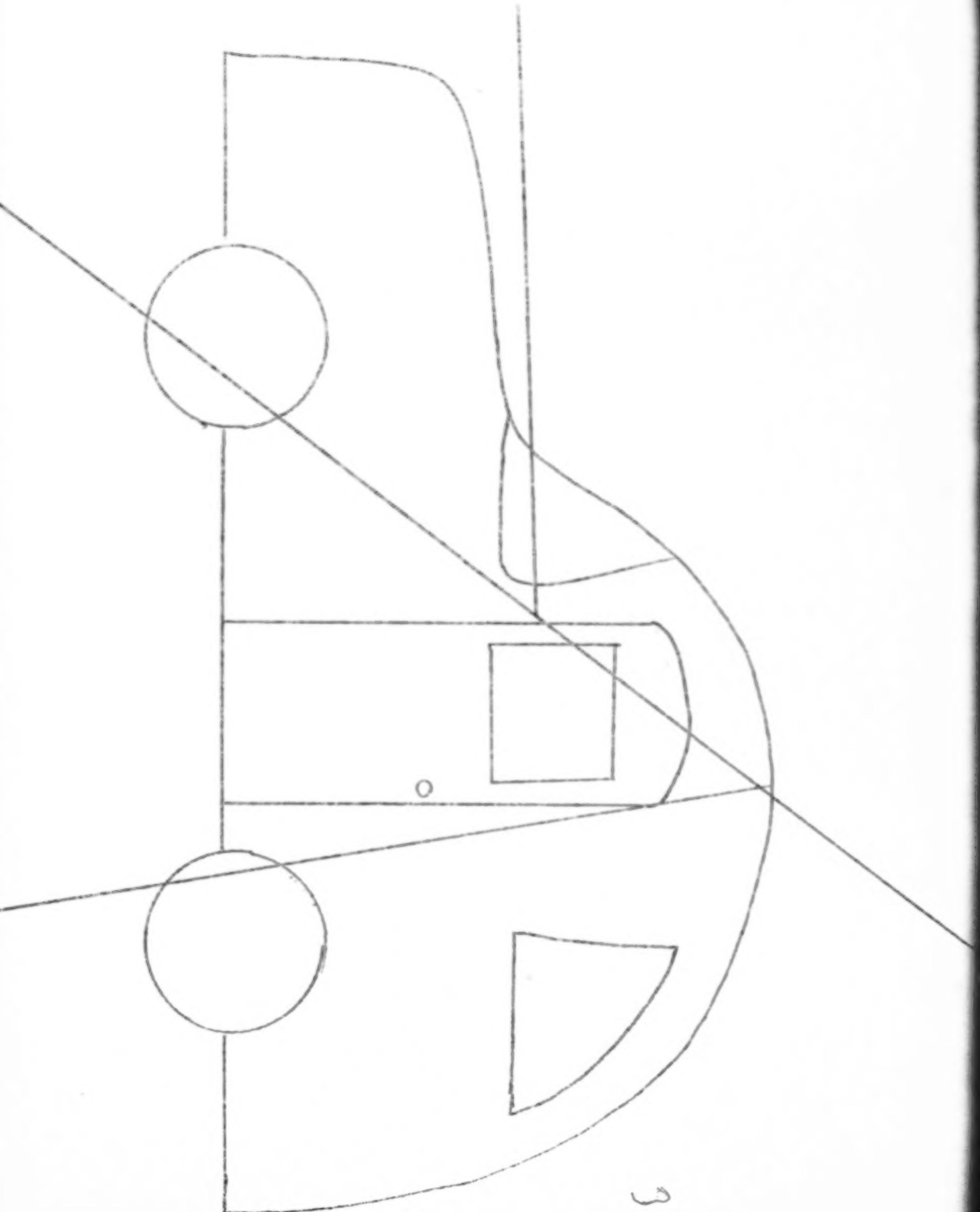
Visual - Temporality - Friday



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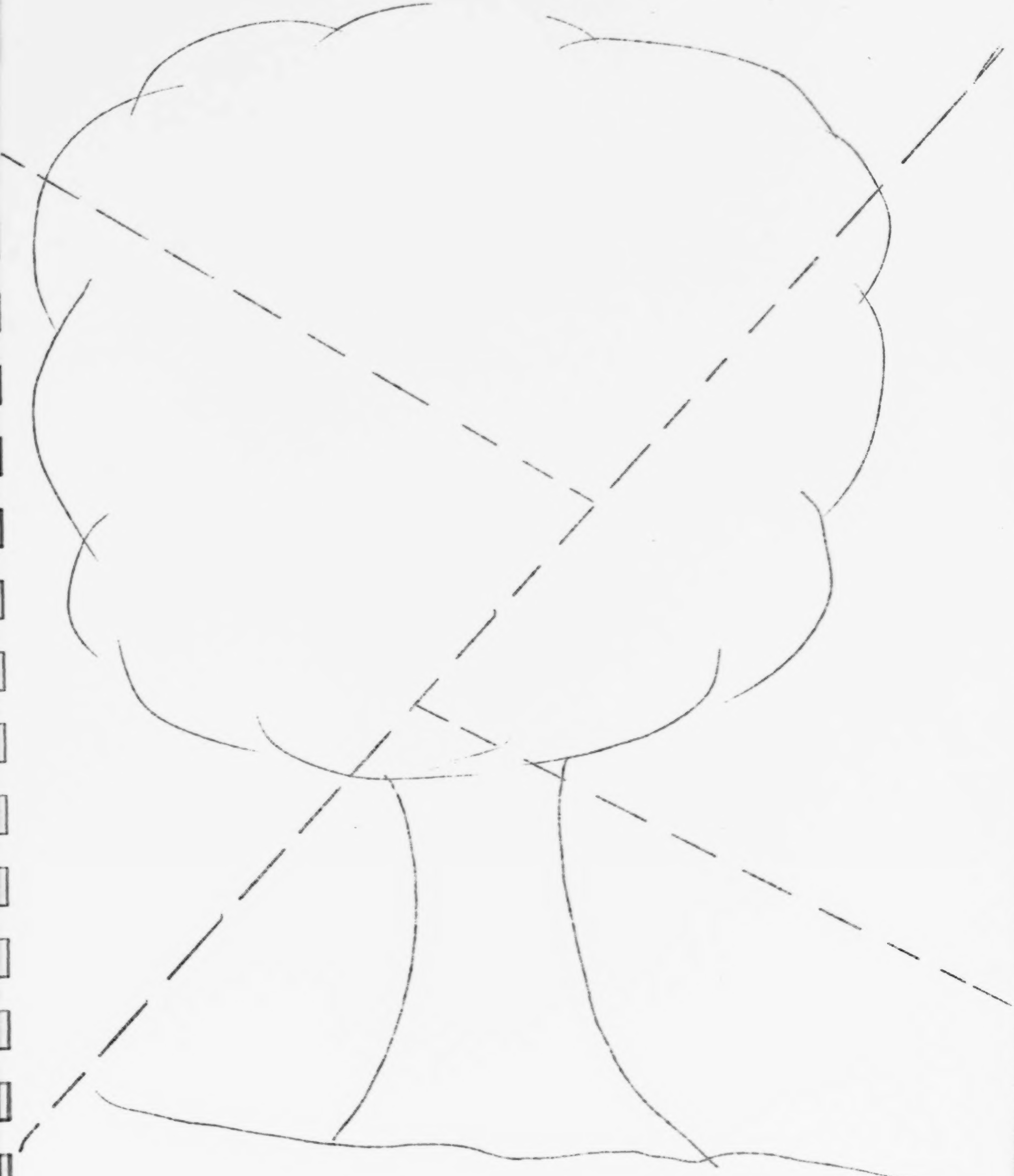
Visual - Temporality - Friday

Visual - Temporality - Friday



EV

Visual - Temporality - Friday

1	2	3	4
5	6	7	8
9	10	11	12

EV

Visual - Temporality - Friday

2	I	I	O	O
A	A	P	P	C
C	H	H	F	F
S	S	K	K	M
M				

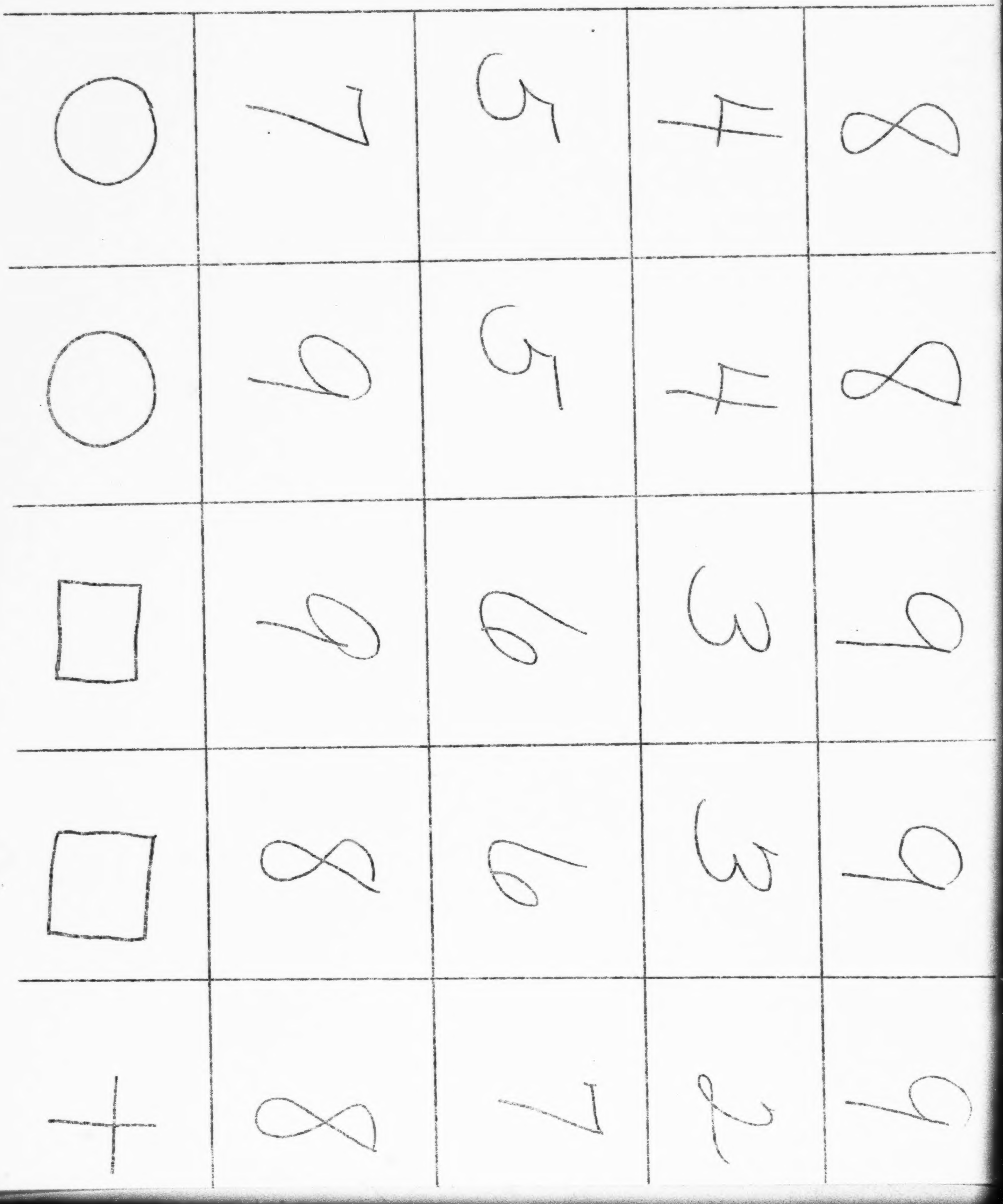
EV

Visual - Temporality - Friday

M	X	F	C	A
M	S	F	C	A
M	S	F	C	A
K	K	H	P	P
S	K	H	H	P

EV

Visual - Temporality - Friday



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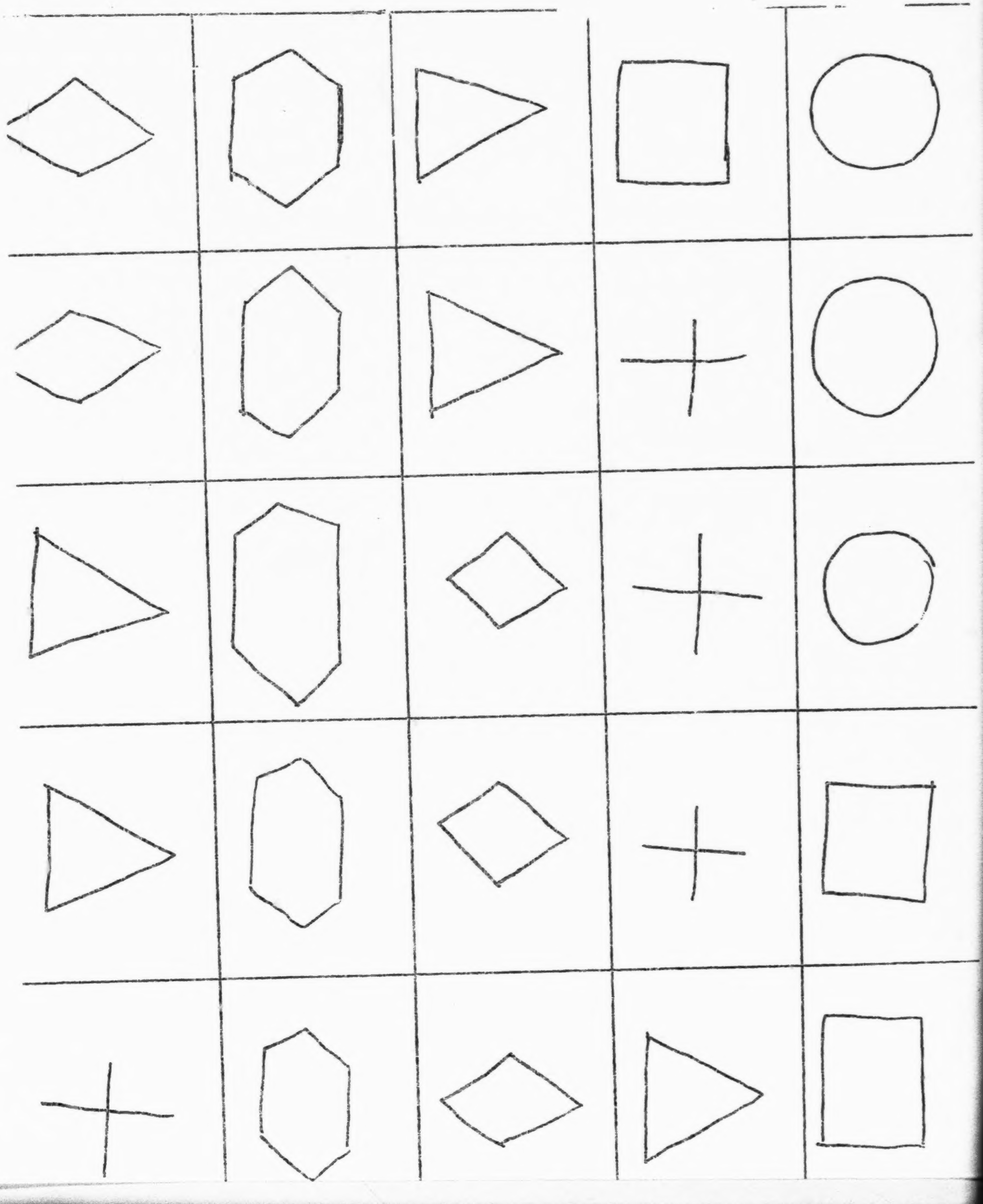
Visual - Temporality - Friday



EV

Visual - Temporality - Friday

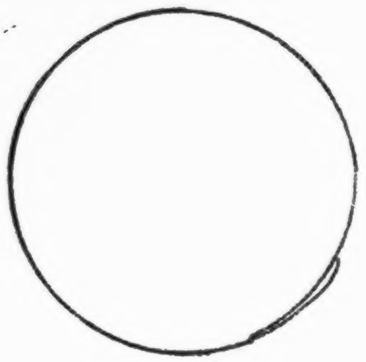
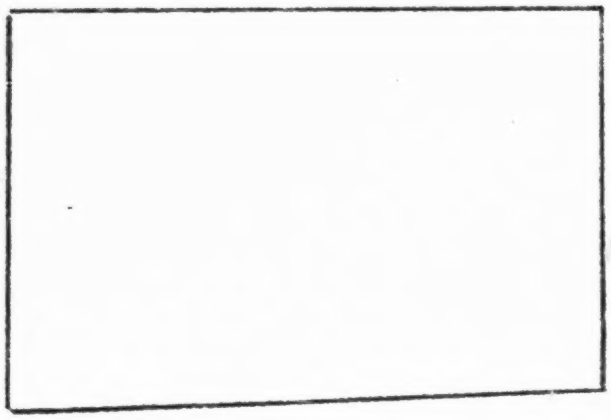
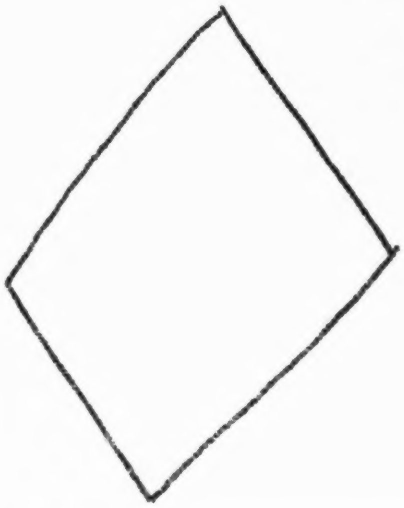
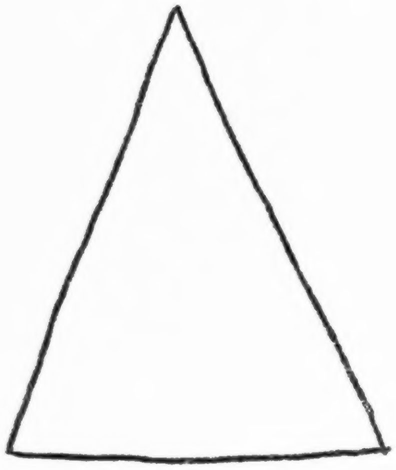
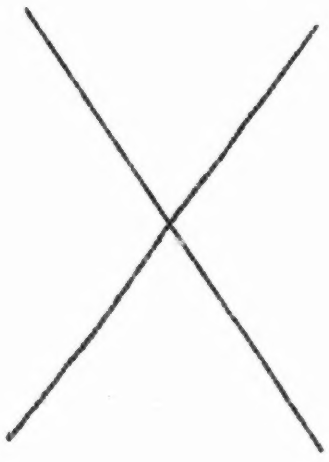
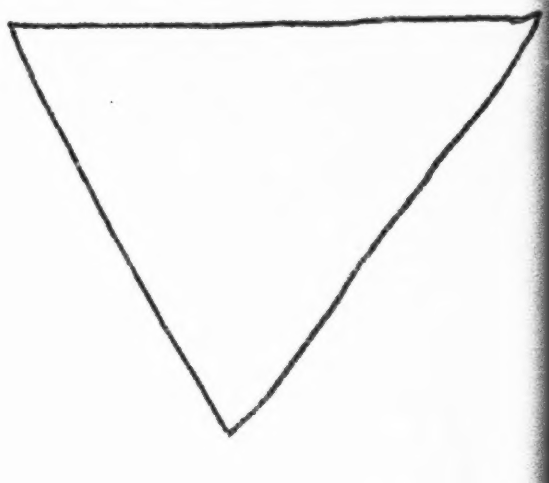
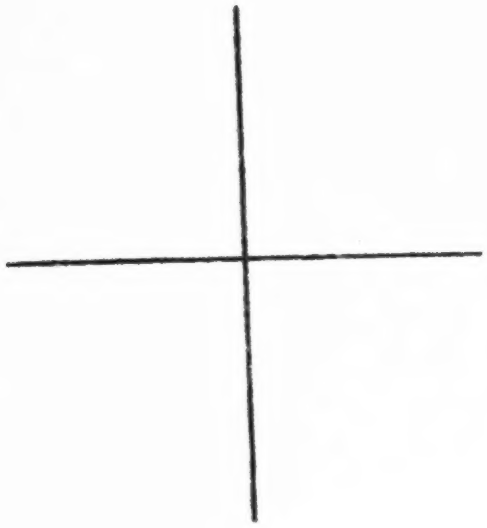
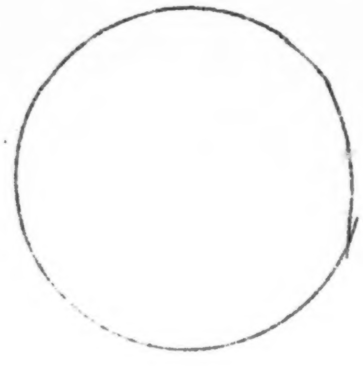
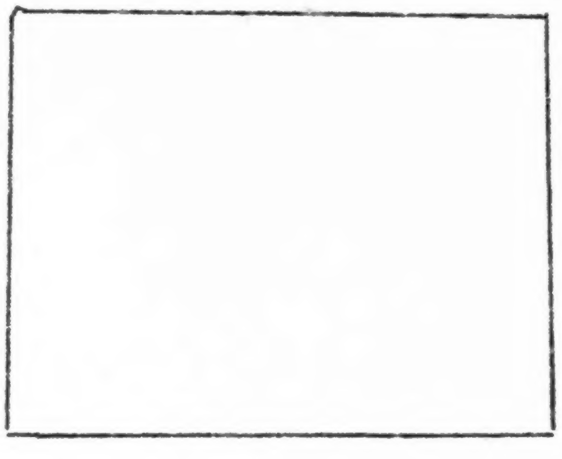
ABCD

DCBA

CATS

EV

Visual - Temporality - Friday

EV

Visual - Temporality - Friday

0 8 2 1 3

4 6 5 9 1

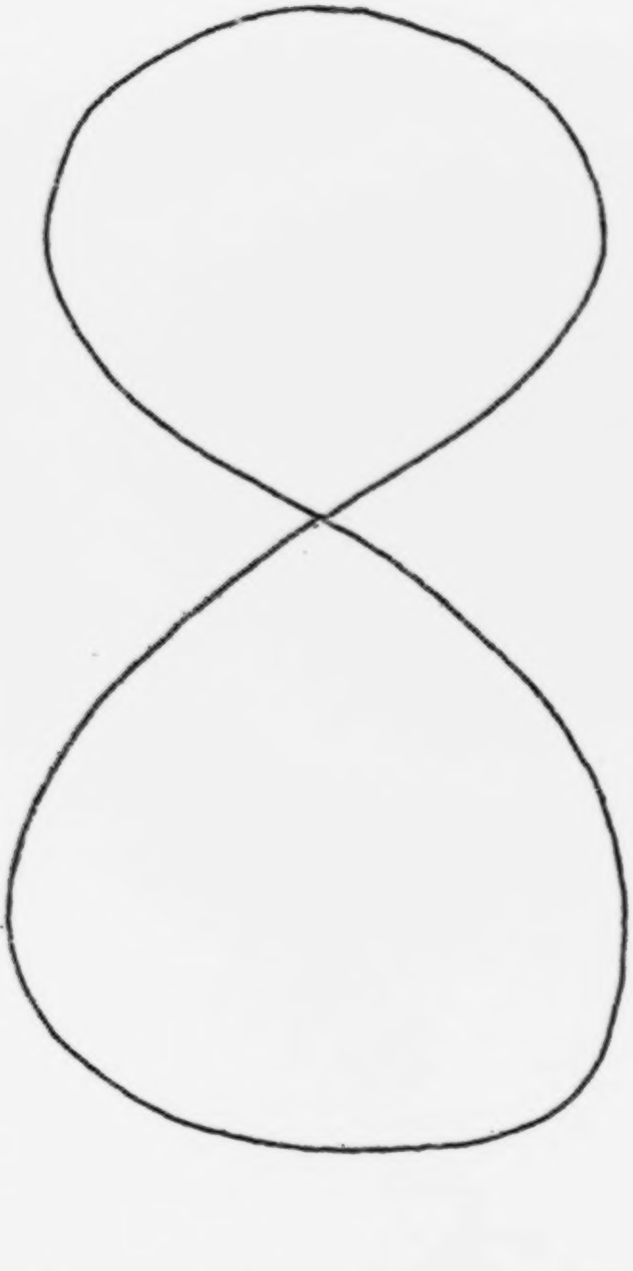
6 8 4 9 7

Graphic - Mobility - Monday

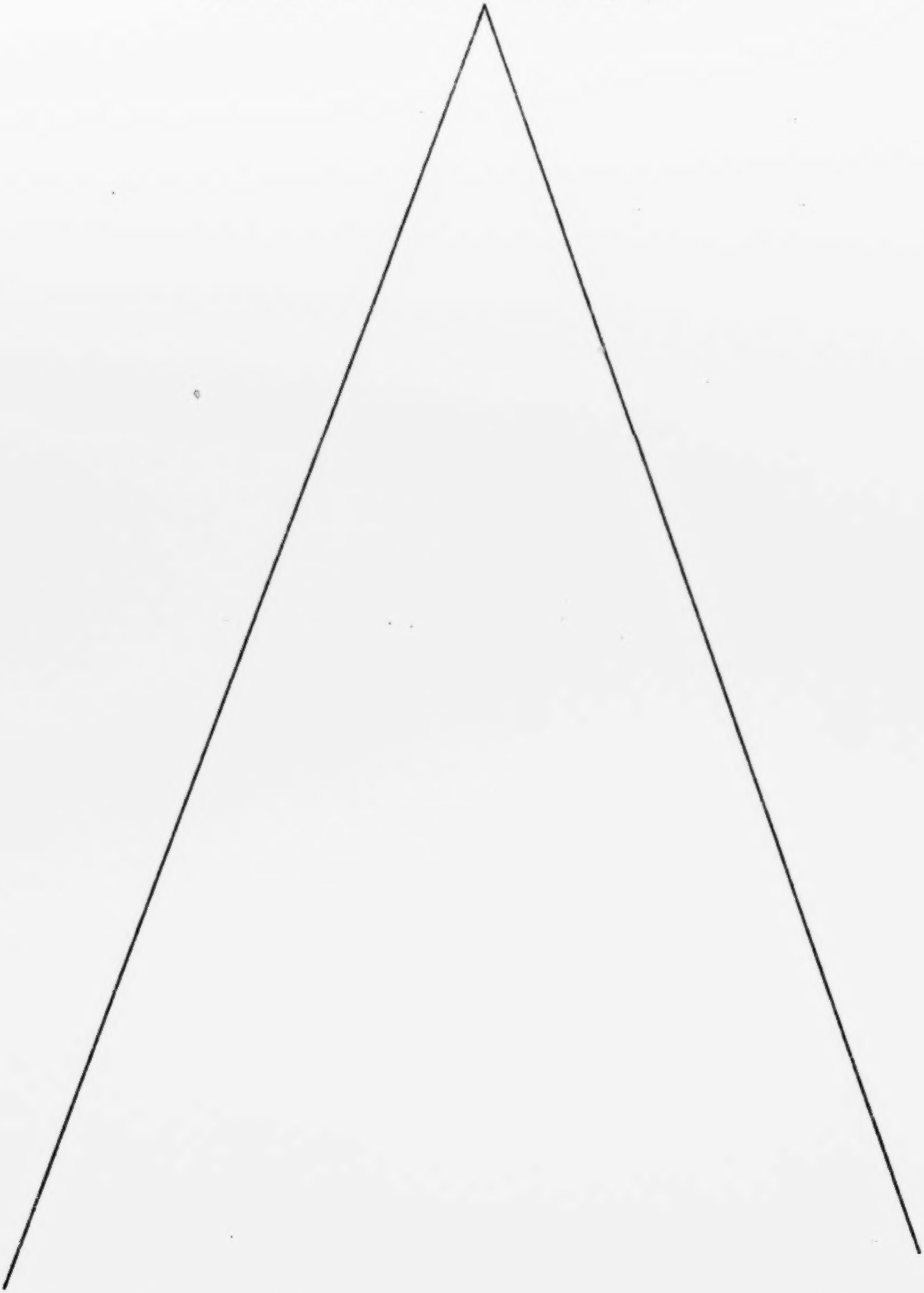
1. Draw and Walk Patterns

Have the children work in pairs. Seat 15 children at tables, and let the other 15 stand behind them (1 child behind everyone seated). You will have several charts to show them, 1 at a time. Supply the children seated with pencil and paper. As you hold up the first chart, the child seated reproduces it on his paper. When he is finished, the child standing behind him tries to walk the pattern after seeing it visually twice (once on your chart and also when the child drew it). Do all of the charts, then have the children switch and do the charts again so that every child will get to draw as well as walk the pattern.

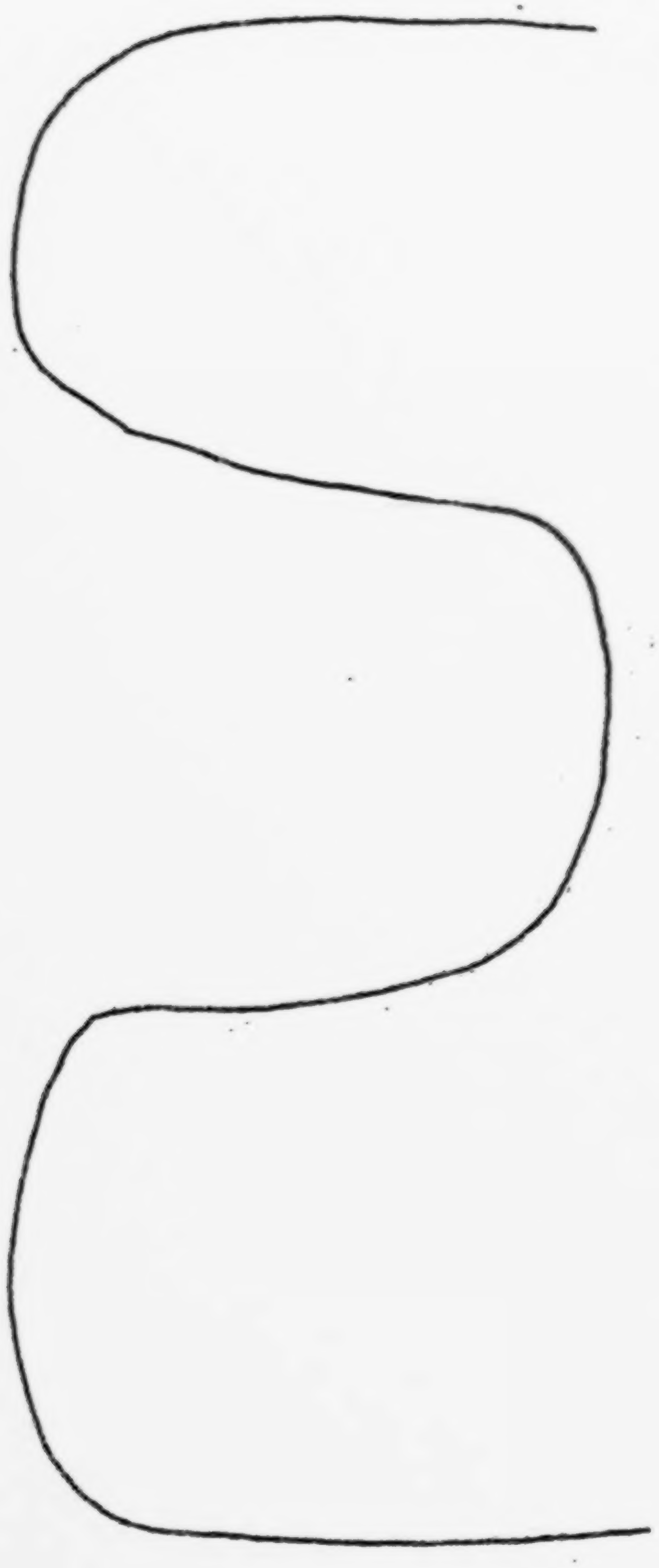
Draw & Walk -- Graphic - Mobility - Monday



Draw & Walk -- Graphic - Mobility - Monday

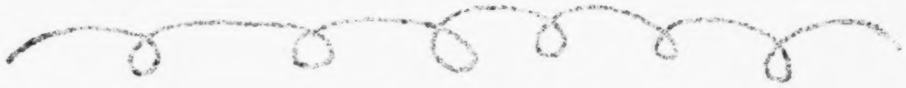


Graphic - Mobility - Monday

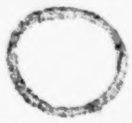


Graphic - Mobility - Monday

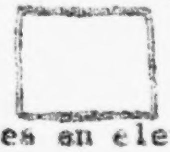
i. How does a ball roll?



ii. How does mother stir her cake?



iii. How does a car go around the block?



iv. How does an elevator go?

v. How does a swing go?

vi. How does a train go over a hill?

vii. How does a fish swim?

If pupils seem to be able to make this transposition--Okay--if not, don't push and try it again on the next graphic period.

Graphic - Mobility - Monday

The purpose here is to train the transposing of movement into a graphic representation.

1. Teacher or leader directed

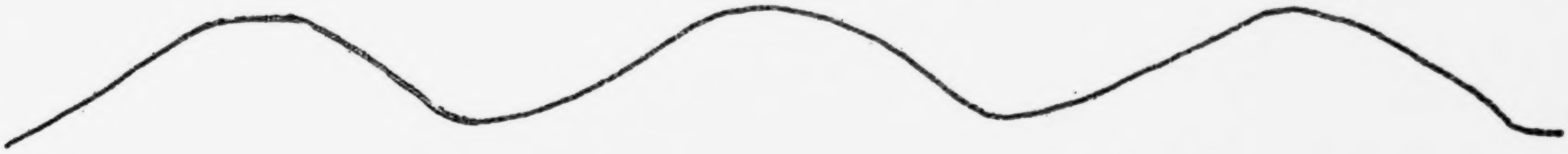
In order to get the pupils started thinking in this type of drawing, they may require some initial help and direction. The pupils experienced a little of it during the testing and seem to have some difficulty. Consequently to begin with, the transposition will be very simple.

a. Straight line reproduction

The entire class does this at one time, with teacher demonstrating. Instruct the pupils to watch carefully how you are going to walk, then they are to draw a line on their paper just the way you walked. Demonstrate by walking in a straight line from a specific point for 10-12 feet. Remain at the end point and have them draw the line. Spot check to see if they perceive the idea. Pick a sample to show the whole class--"this is the way it should be"--"I walked in a straight line."

b. Serpentine reproduction

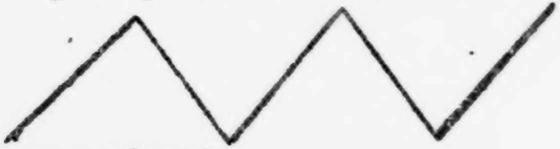
Proceed as above only make a large snake-like movement across the room. It can be reinforced by either telling them or asking them what moves like this. If meeting with sufficient success go on to the next movement; otherwise, let them repeat until most pupils get the idea.



Graphic - Mobility - Monday

c. Zig-Zag reproduction

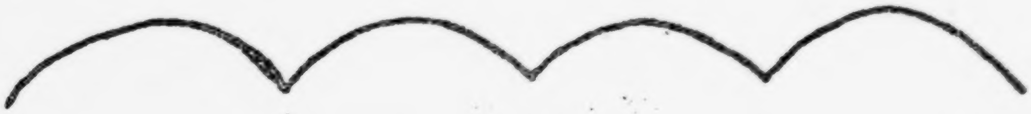
As before, only make the movement exaggerated and emphasize angles.



d. Jumping reproduction

Don't expect many pupils to be able to perceive this one, but it will give you an idea of how well some may have captured the process. Don't attempt to explain it or over emphasize. Tell them to watch how you move this time, and that this is different from all the others.

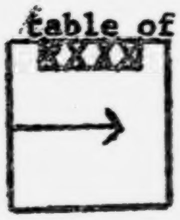
Jump several times with both feet together (or have a pupil do it), part way across the room. Hopefully, some pupils will show the up and down reproduction.



3. Pupil directed

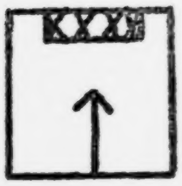
Pupils can work in pairs or small groups (not more than 4). Have one as the movement maker and others doing the drawings. Have them alternate often so that each has a chance to do the drawing and make the movement patterns. The pupil directing can use these patterns; these are also on a separate chart. The pupil directing has the reversed type of transposition to make in that he has to interpret the chart and put it into movement. Consequently, they too are quite simple to begin with.

Chart A. table of pupils



(straight line walked by pupil)
Each child will walk only 1 chart, so that each child gets a chance.

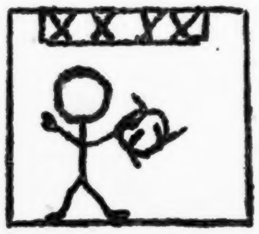
Chart B.



Graphic - Mobility - Monday

Chart C.

Rather than have the pupil walk on this one, he is to move 1 arm making a circular motion in the air.

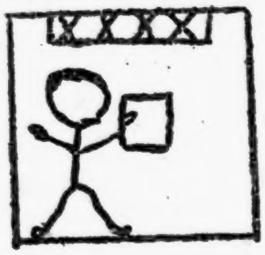


If child does not perceive the chart, verbal directions may be necesessary.

Drawers hopefully will reproduce a circular pattern.

Chart D.

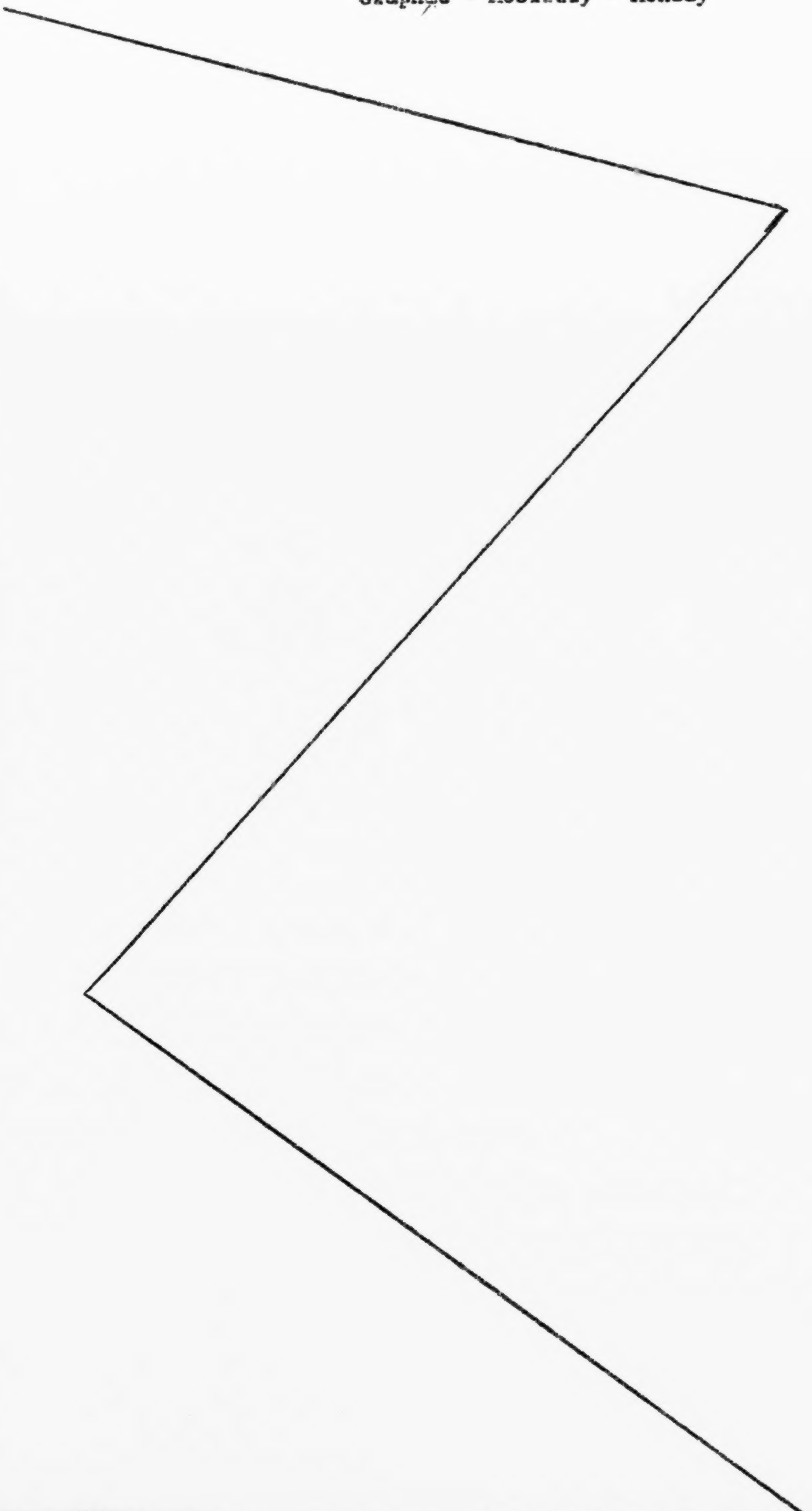
Have pupil, as above, make an arm movement of a square for his group.



4. Projected movement.

Here the pupils can be grouped in any convenient manner, or it can be tried with the whole class. The activity is to see if the pupil can put down in graphic form the way certain things or animals move from their imagery. Supply pupils with paper and crayon. To begin with, on the first one, a child can be asked to show the class: "How does a rabbit go or move?" This can be a demonstration item. After the child has shown how a rabbit goes, see if pupils can make a line to show it. Then proceed with:

Graphic - Mobility - Monday



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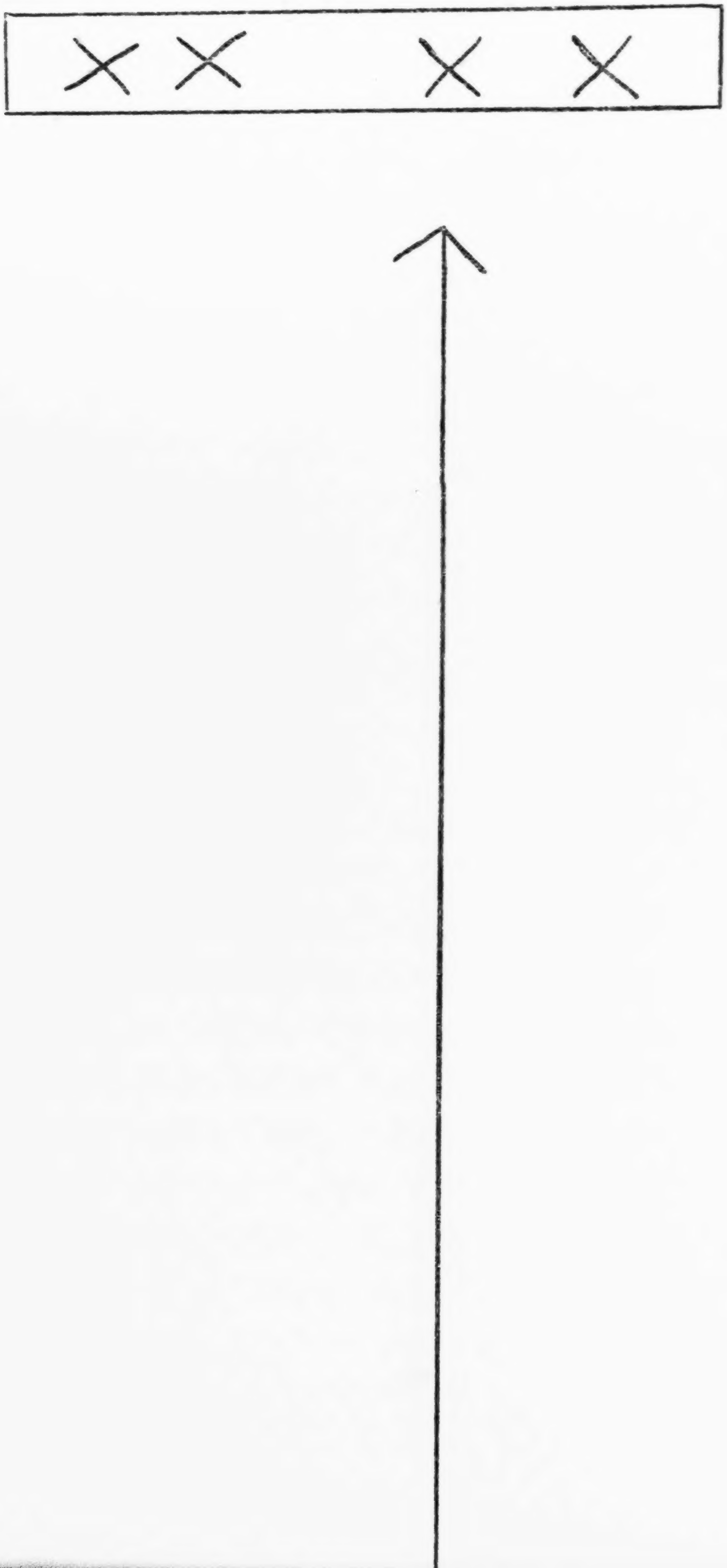
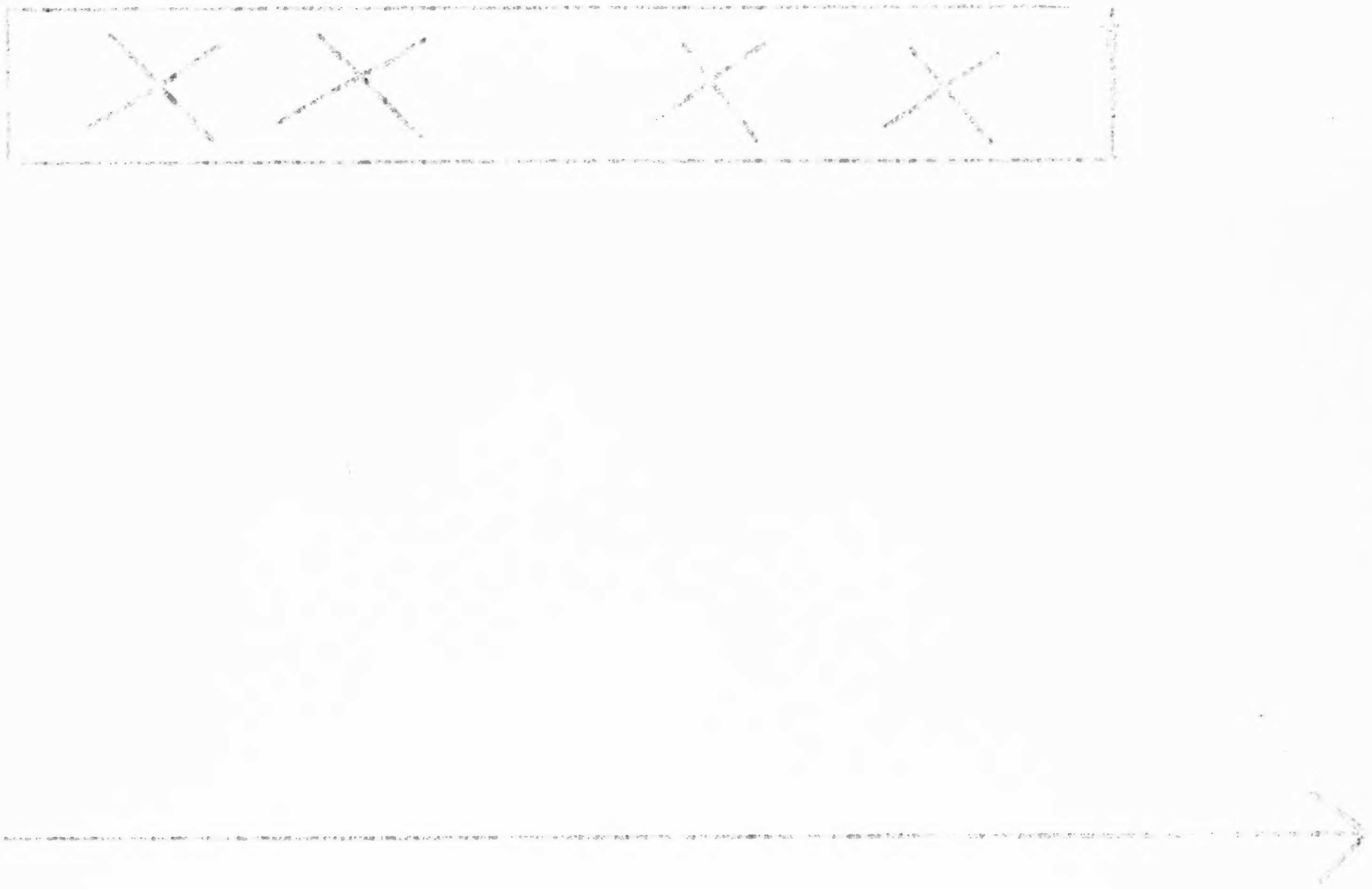
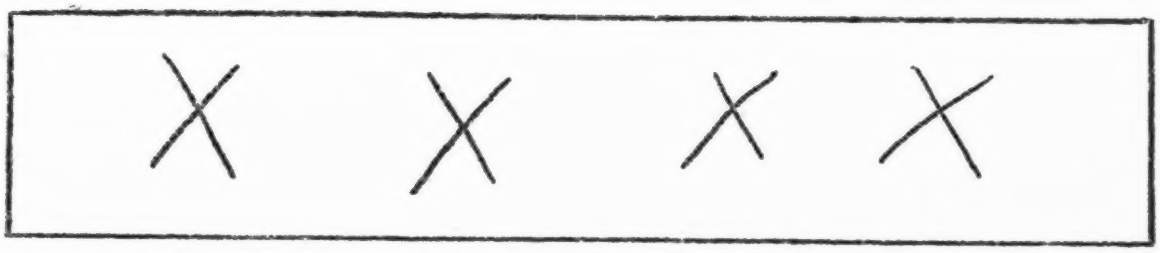
Graphic - Mobility - Monday

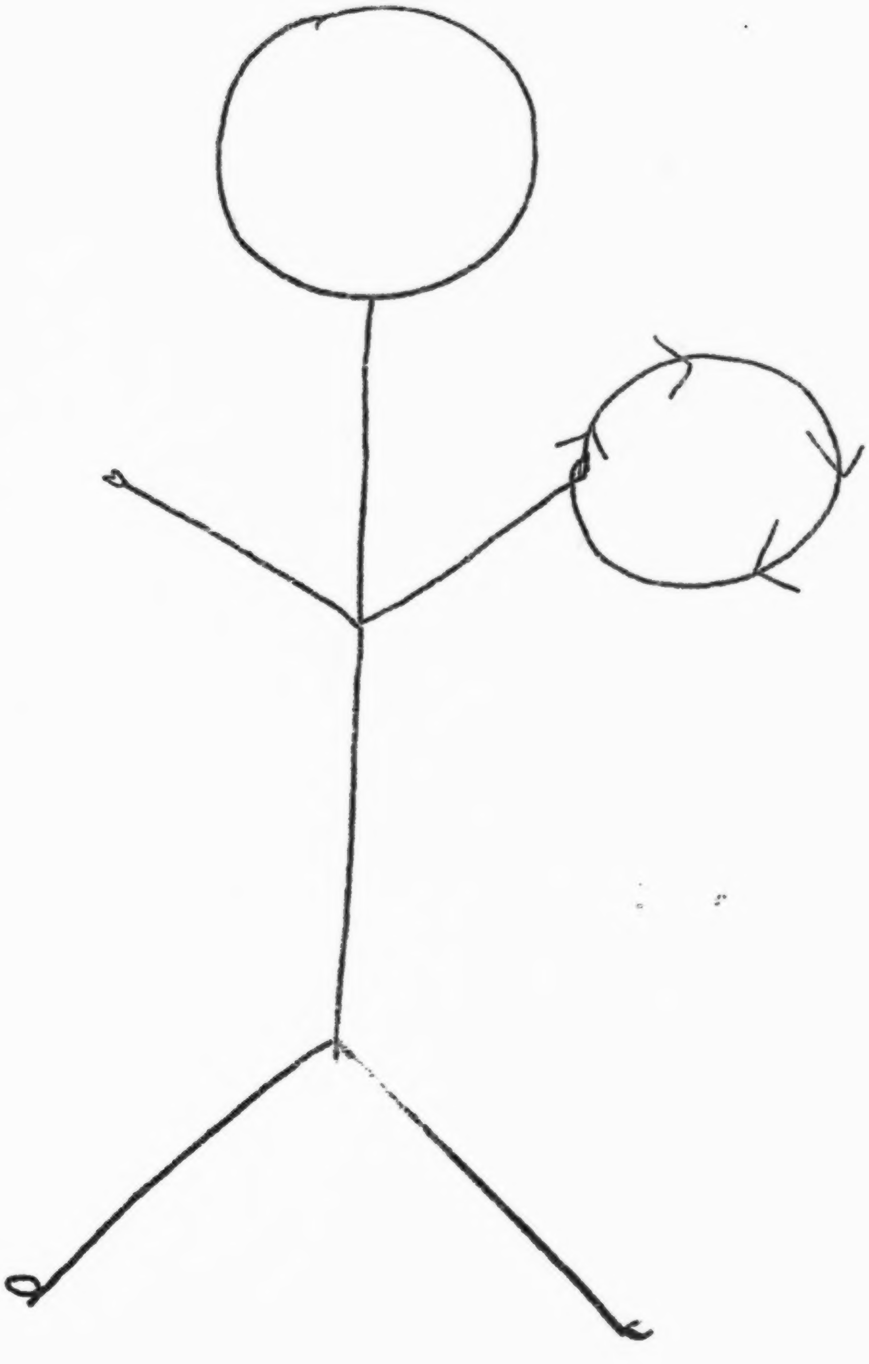


Graphic - Mobility - Monday



Graphic - Mobility - Monday





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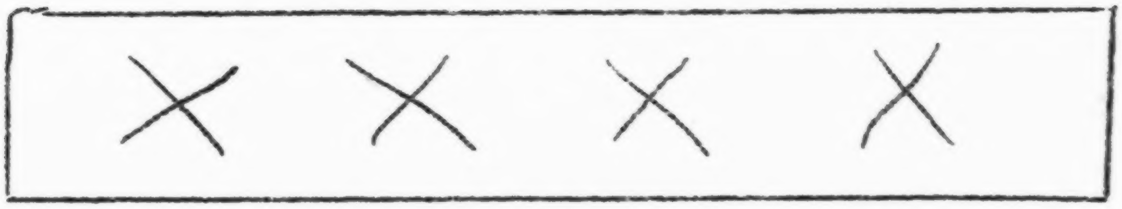
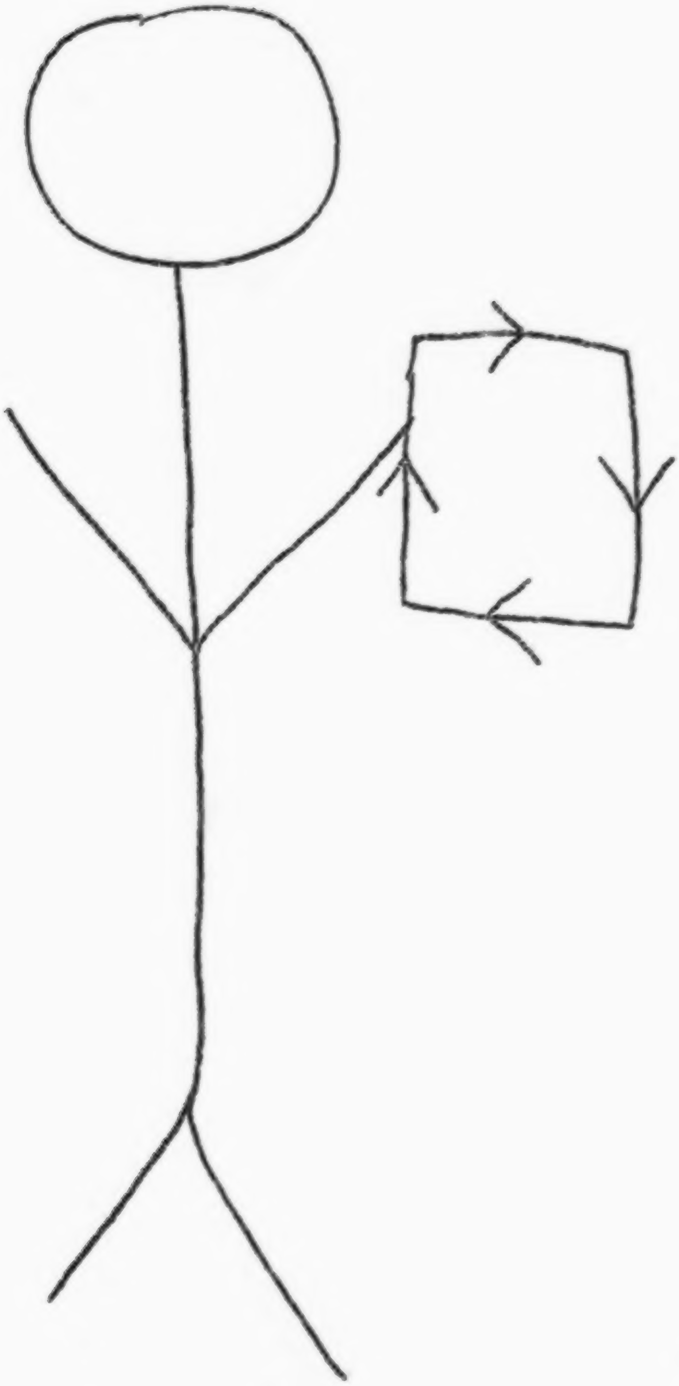
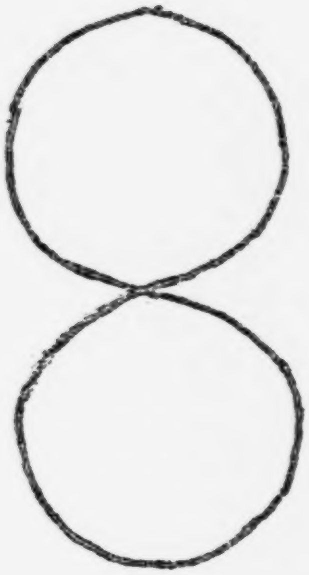
Graphic - Mobility - Monday

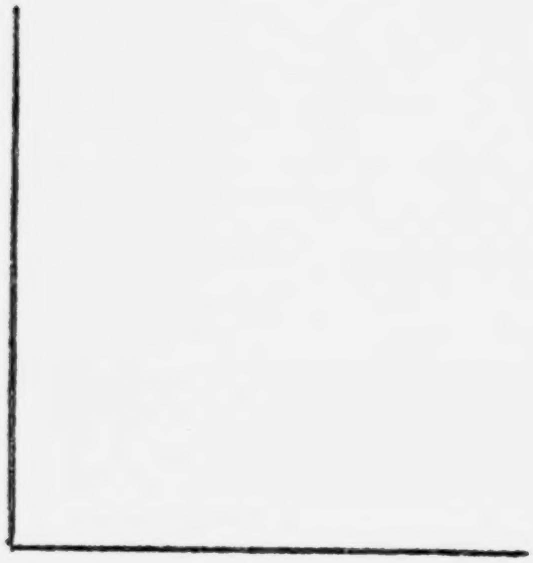


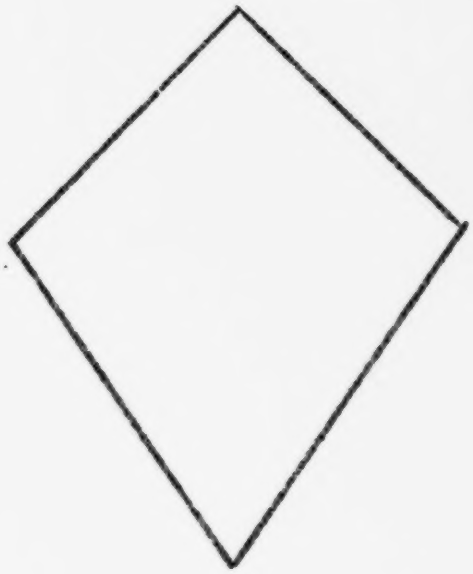


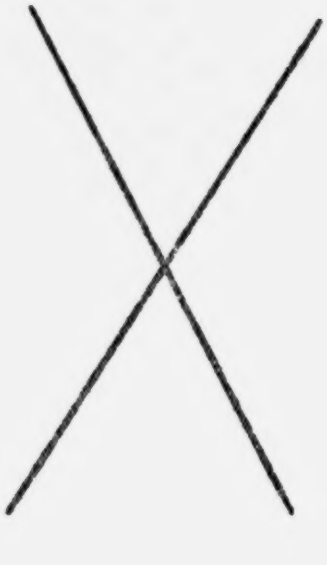
Graphic - Directionality - Tuesday

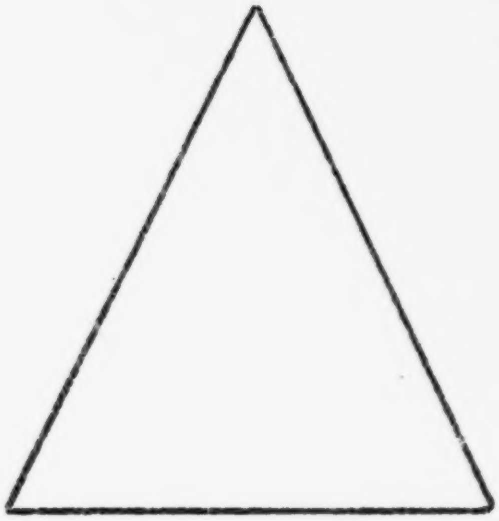
MODEL CHART

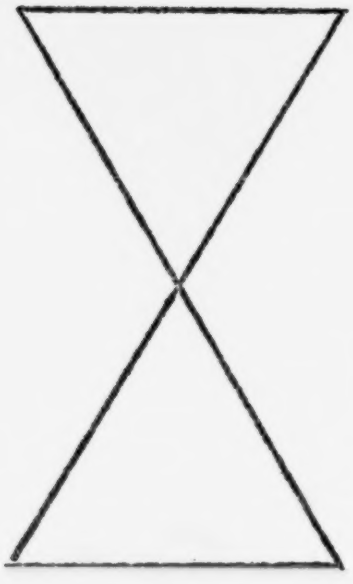












Graphic - Directionality - Tuesday

The purpose here is to transfer the sense of direction onto paper and into graphic performance.

1. Chalk Work

Group according to working space available. You have a roll of brown paper. Cut enough strips so that every child has 1 strip. Make the strips about 36" wide. Tape as many as you can up at 1 time. Then have the children reproduce the objects that are on the model chart. If you can tape it to the cupboard doors or walls, that would be fine. Give them each a piece of crayon or chalk to draw with.

Graphic - Directionality - Tuesday

2. Crayon Work

All the children can work at 1 time on this section. Give each pupil 1 crayon. This is a 3-stage process that is to be done on dittos.

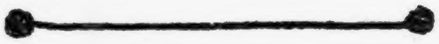
a. On the first ditto have them just trace over the designs that are already there.

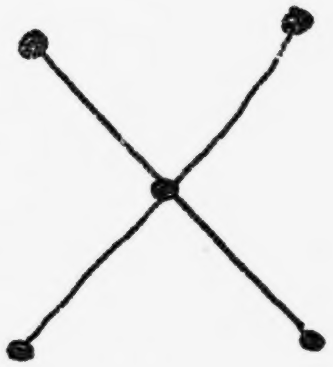
b. On this ditto have them connect the dots so that when they are finished it looks like their first paper.

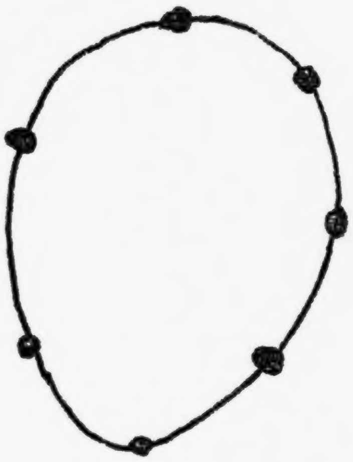
c. On a blank sheet of paper have them reproduce the designs that were on the first ditto. You will probably have to remind them not to reproduce the dots, but just the lines.

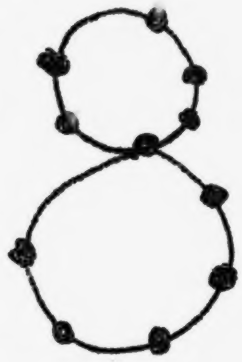
Graphic - Directionality - Tuesday

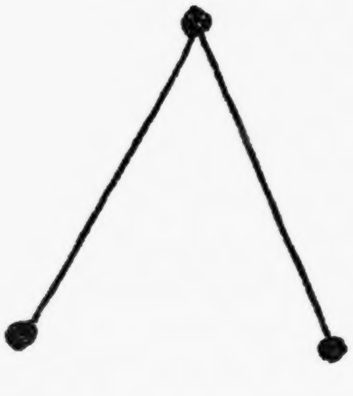
Trace Design

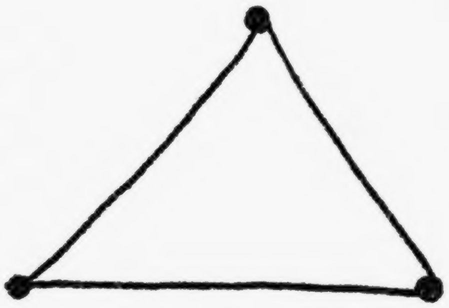


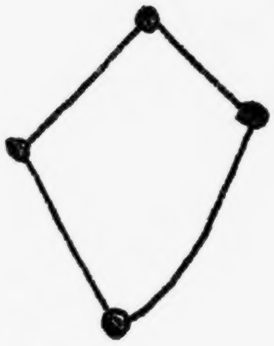


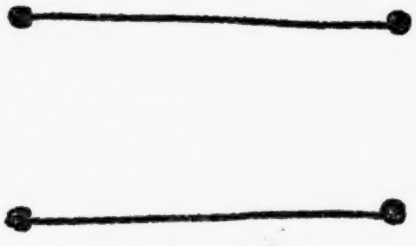


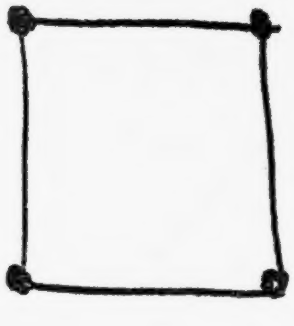


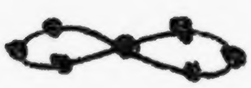


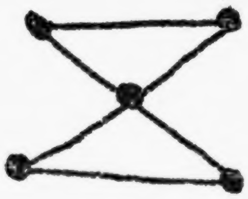


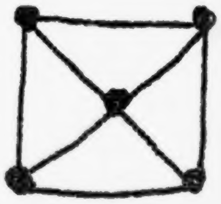






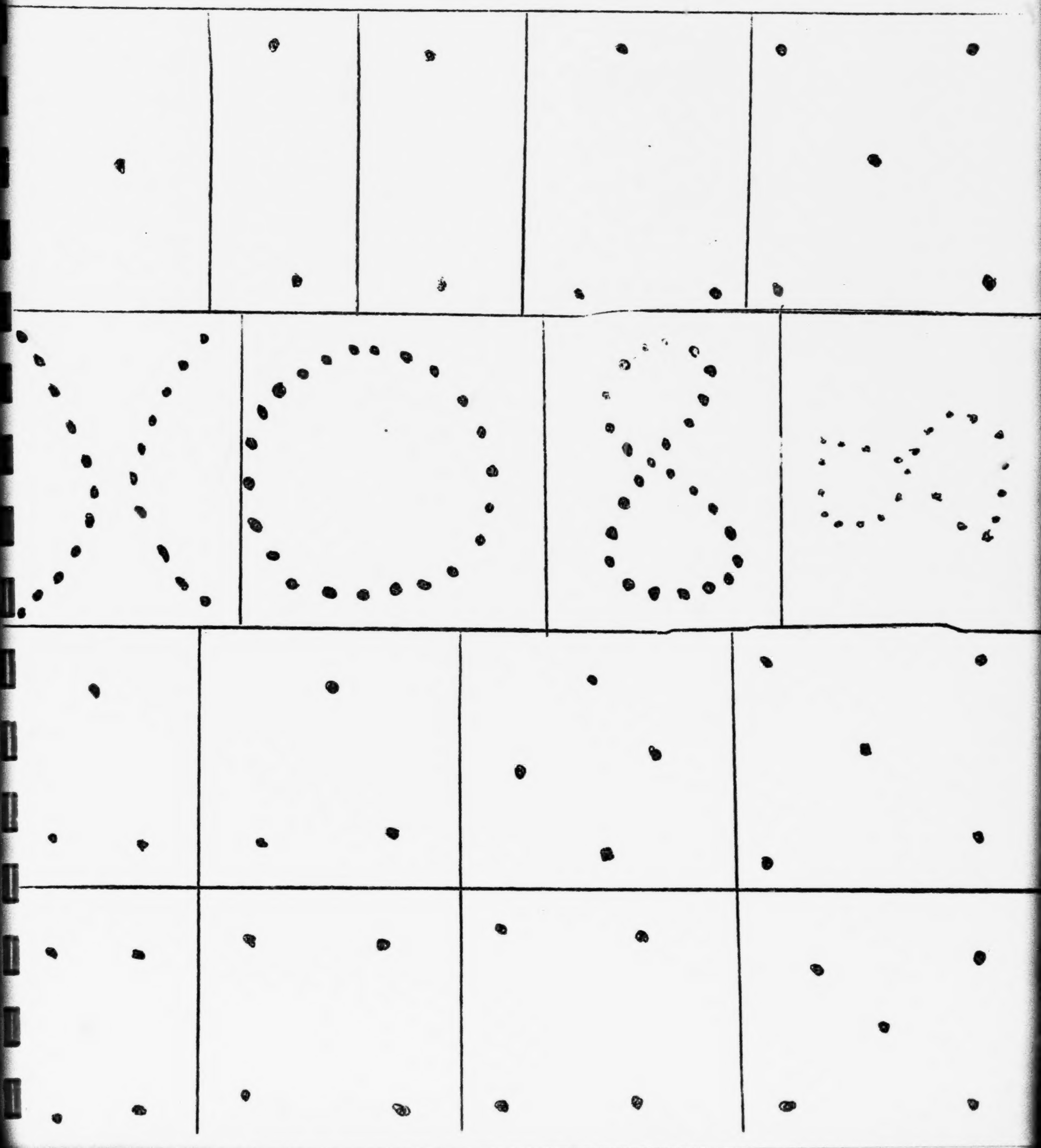






Graphic - Directionality - Tuesday

Dot Chart



Graphic - Directionality - Tuesday

3. Template Work

Pupils can use chalk or crayon on the long brown paper for this activity. The finger mazes can serve as the templates. Have the child trace the design on the finger maze, then right next to it have him reproduce it free hand. Unroll long strips of brown paper so that several can work at once and so that each 1 will have plenty of paper. Let each pupil do 3 of the mazes.

Graphic - Spatiality - Wednesday

The purpose here is to develop the conceptualization of space and transfer it to graphic utilization of space.

1. Bodily Spatial Organization

   a. Full scale drawing

Have the pupils work in pairs, using brown paper on the floor. Set up as many pairs as the room permits. Have 1 pupil trace around the outline of the other with crayon or chalk. Then encourage the child to fill in as much detail as he can. Then they trade off, either after outlining or filling in the detail, depending on how the pair works together.

   b. Small scale drawing

Have pupils draw a picture of themselves or their partner on 8 by 11 ditto paper. Interesting comparisons may develop from drawings before and after tracing.

Graphic - Spatiality - Wednesday

2. Paper Spatial Organization (using pencil)

   a. Where do things go

      Simply have the pupils draw in the missing part in the proper place.

   b. Puzzle Shop

      Have pupil put in the missing part to these designs.

   c. Draw the fingers where they go

      Have the pupil draw the rest of his hand. If this becomes too easy cut off the top of the ditto and see if they can proportion the space.

   d. Bring them together

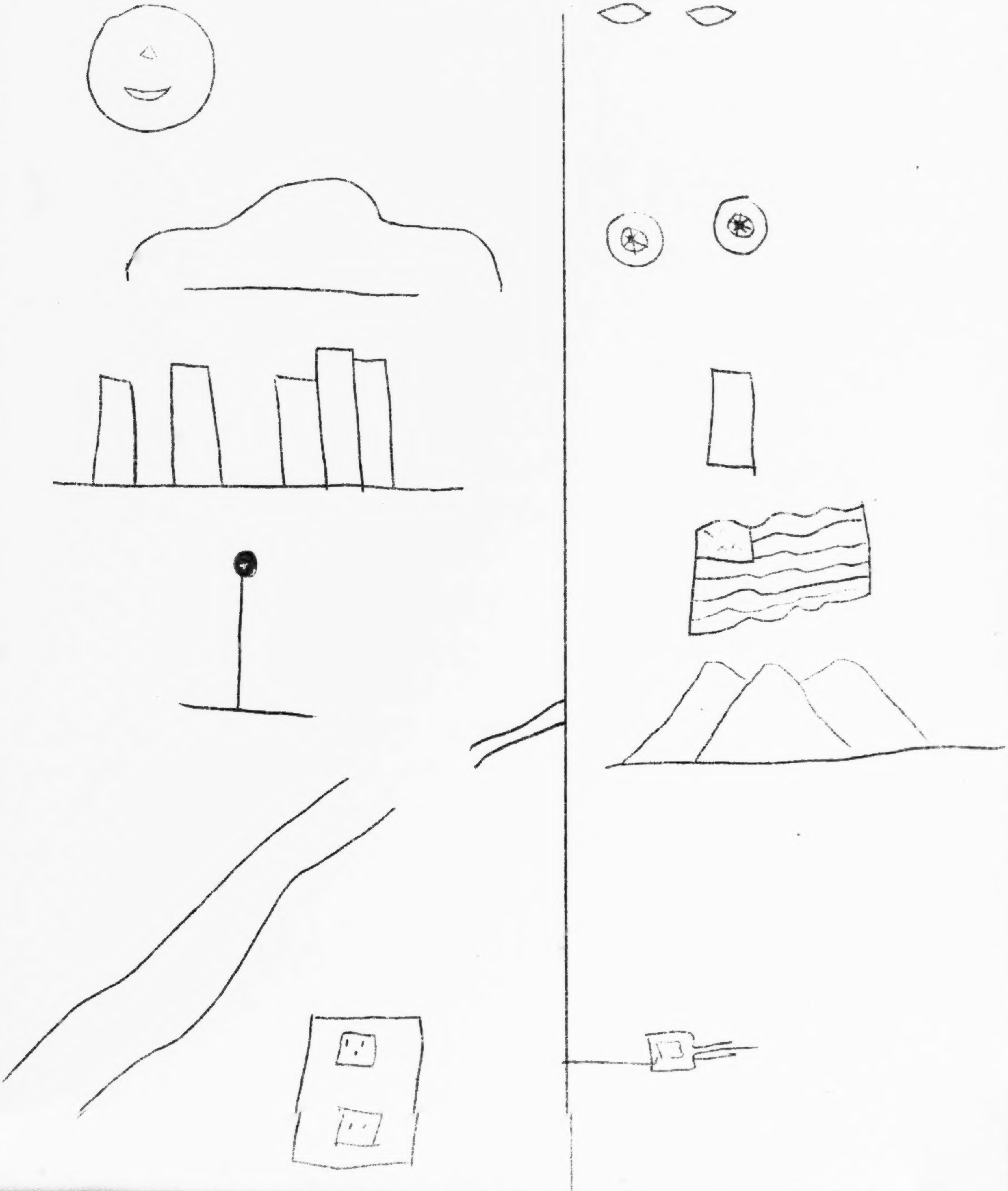
      Give the pupil the models and have them reproduce them on separate paper.

3. Puzzle Work

   Encourage the pupils to do as much independent puzzle work as they can.

Graphic - Spatiality - Wednesday

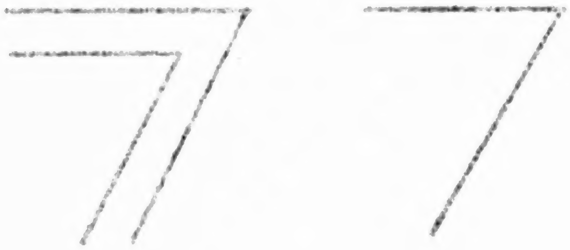
Where Do Things Go?

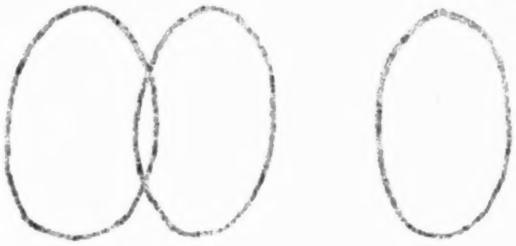


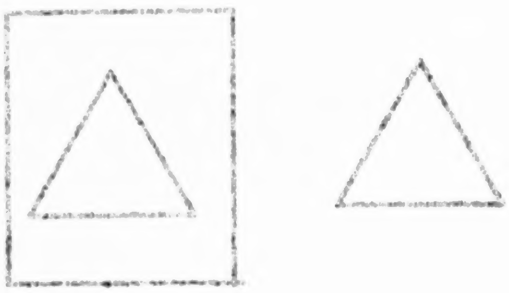
Graphic - Spatiality - Wednesday

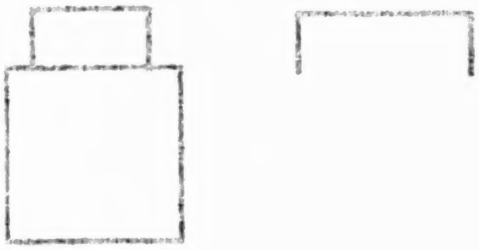
Puzzle Shop

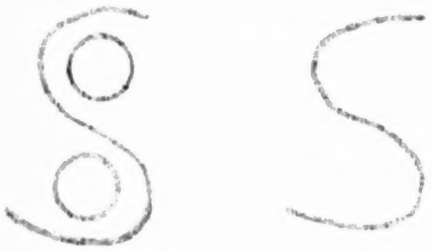
Look at the first form. Now look at the form beside it. What is missing in the second form? What can you draw to make the second form look like the first form?

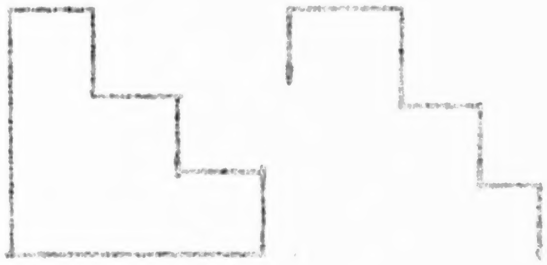


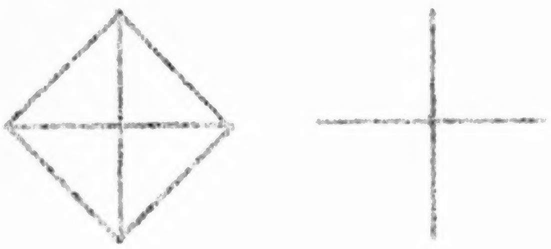


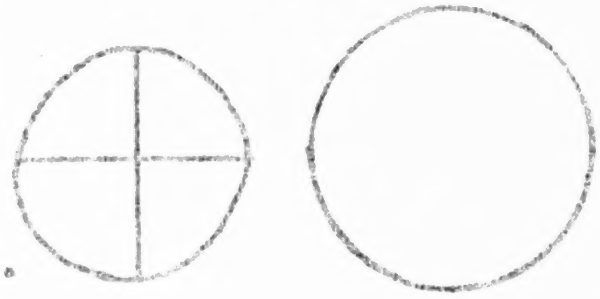






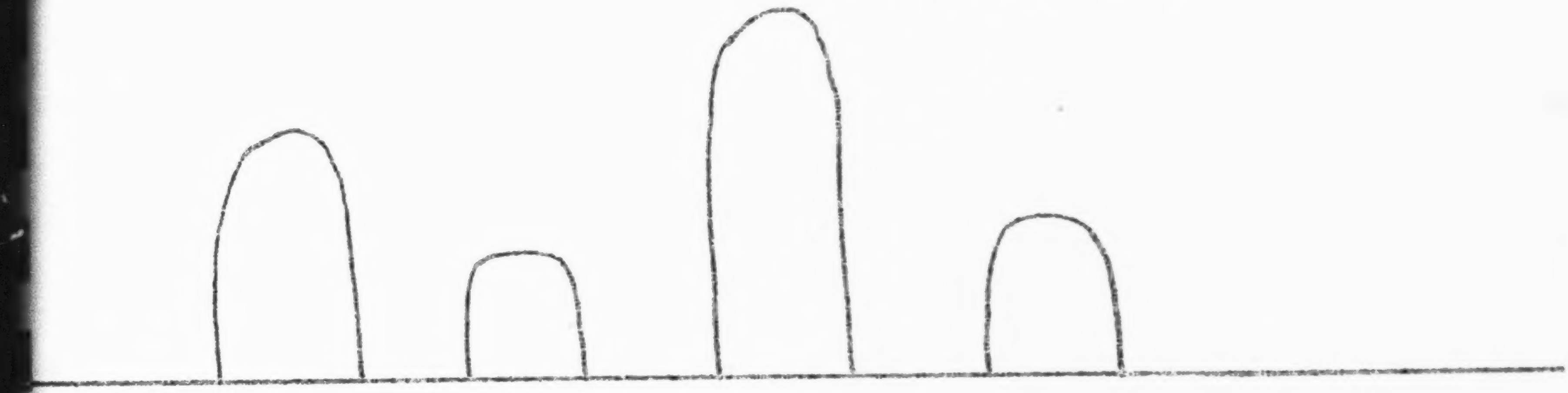


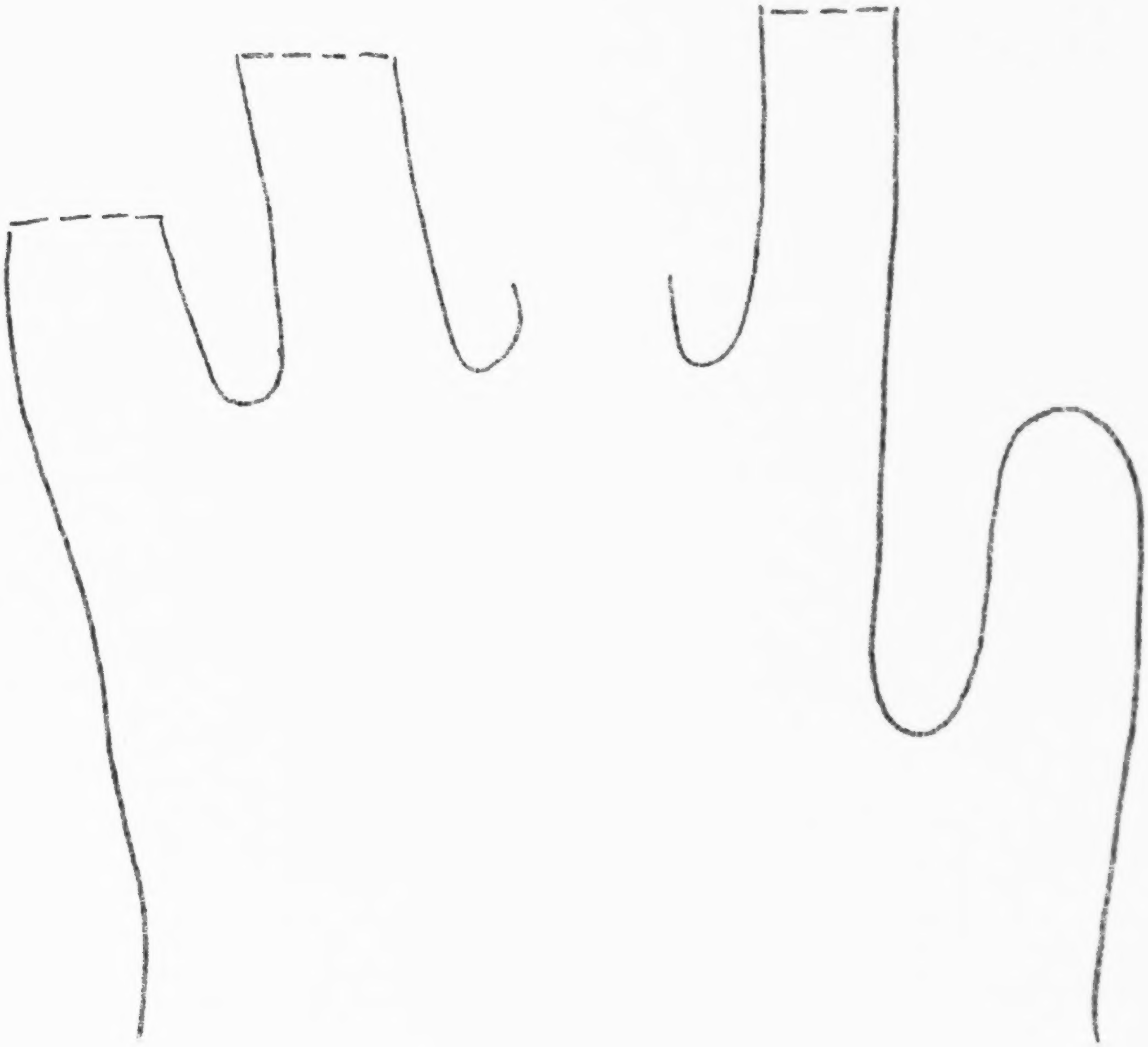




Graphic - Spatiality - Wednesday

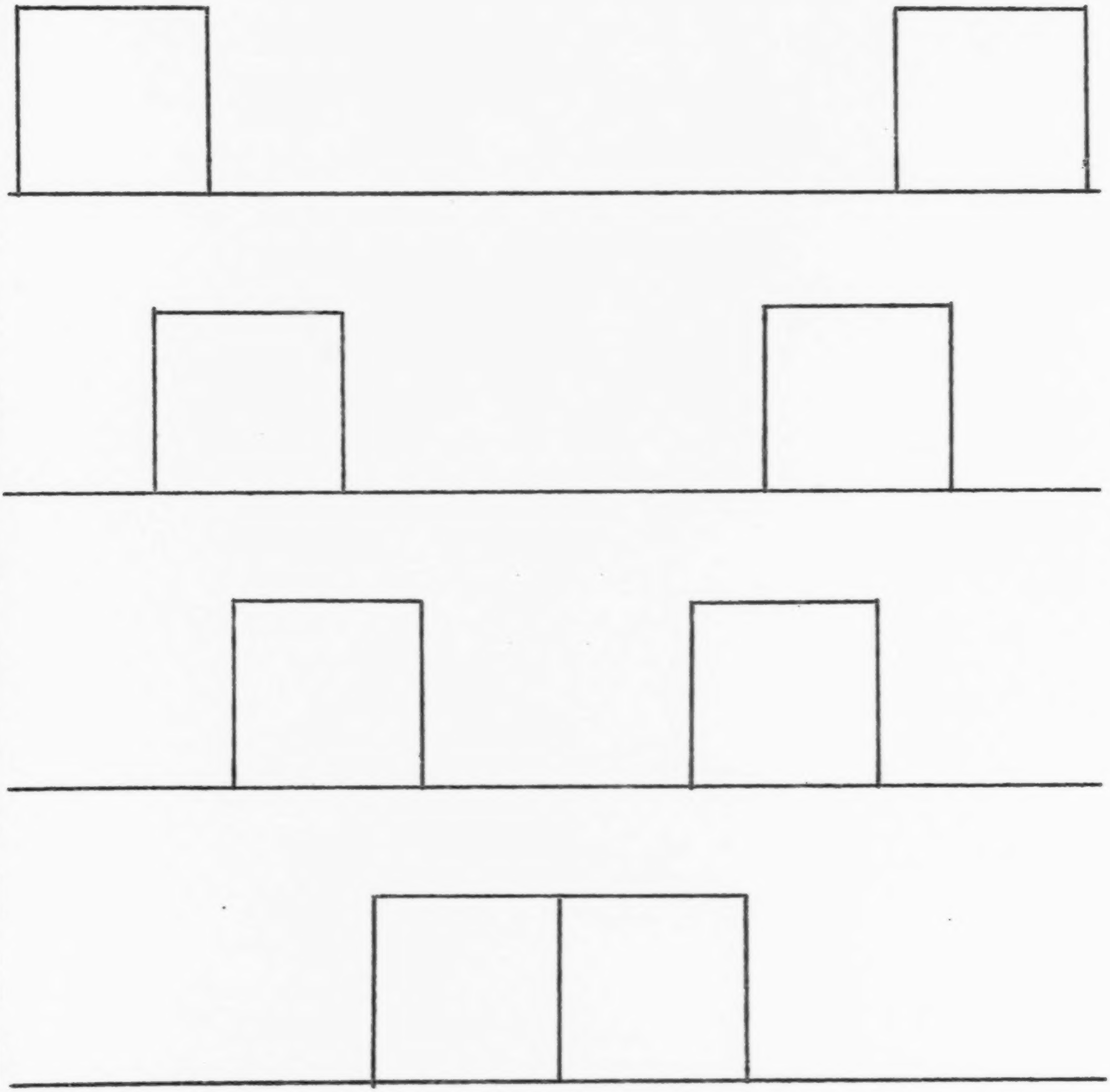
Missing Finger Parts





Graphic - Spatiality - Wednesday

Bring Them Together (a)



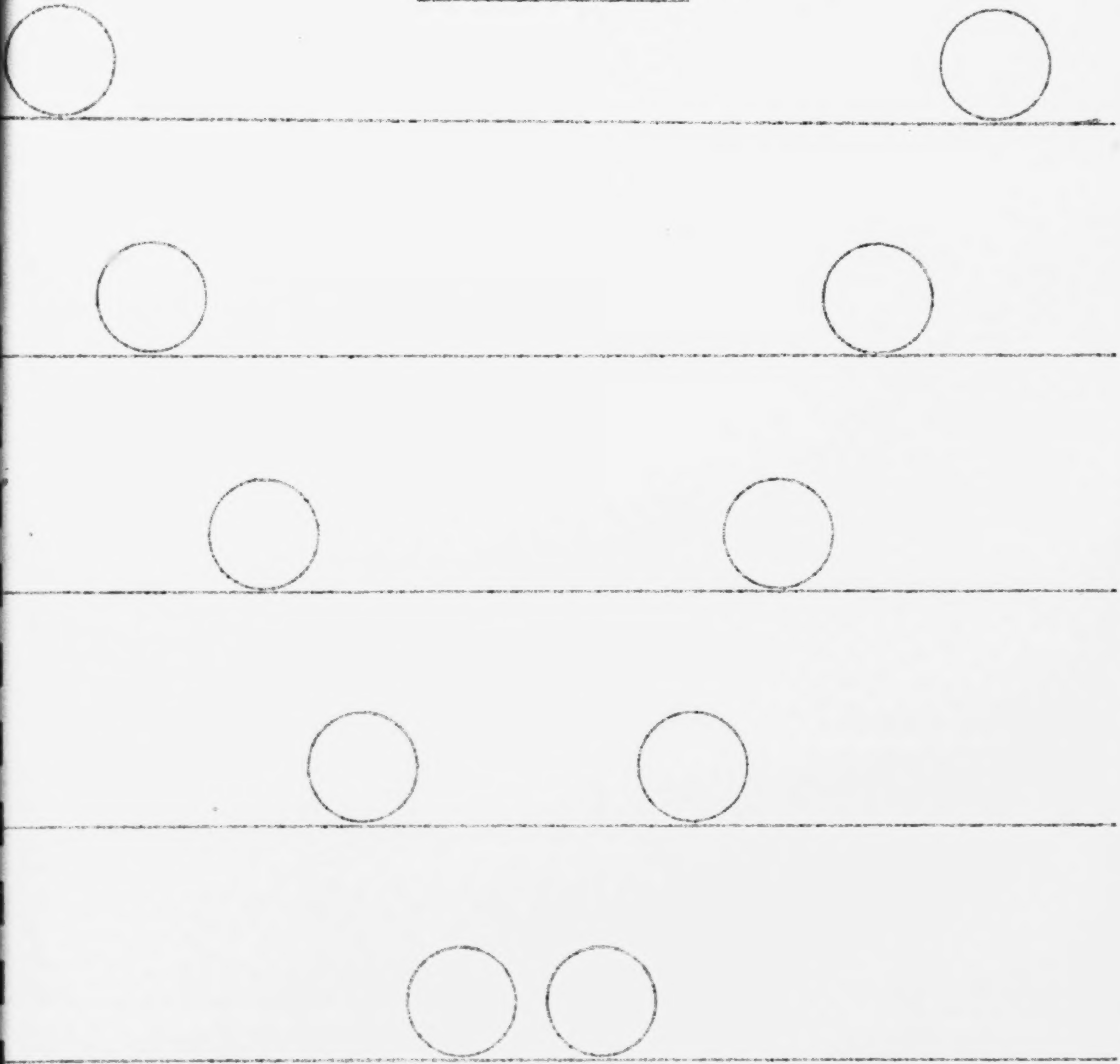
FIII

Graphic - Spatiality - Wednesday

Bring Them Together (a)

Graphic-Spatiality-Wednesday

Bring Them Together (b)



Graphic - Spatiality - Wednesday

Bring Them Together

Graphic - Differentiation - Thursday

The purpose here is to train for the graphic reproduction of things that can be perceived as from a group or mass of things that are mostly the same.

1. Drawing the Circles

From the model ditto of circles and X's, have the pupil draw on the separate page only the circles--leaving out the X's. Ask him to try to put the circles in their correct place.

2. Make the X's all the same

This is a ditto in which the pupil is to complete the X's.

3. Make the Eggs all the same

This is a ditto in which the pupil is to make all the eggs the same as the first egg. Tell them that somebody forgot to put in all of the spots on the eggs, and encourage them to put them where they are on the first egg.

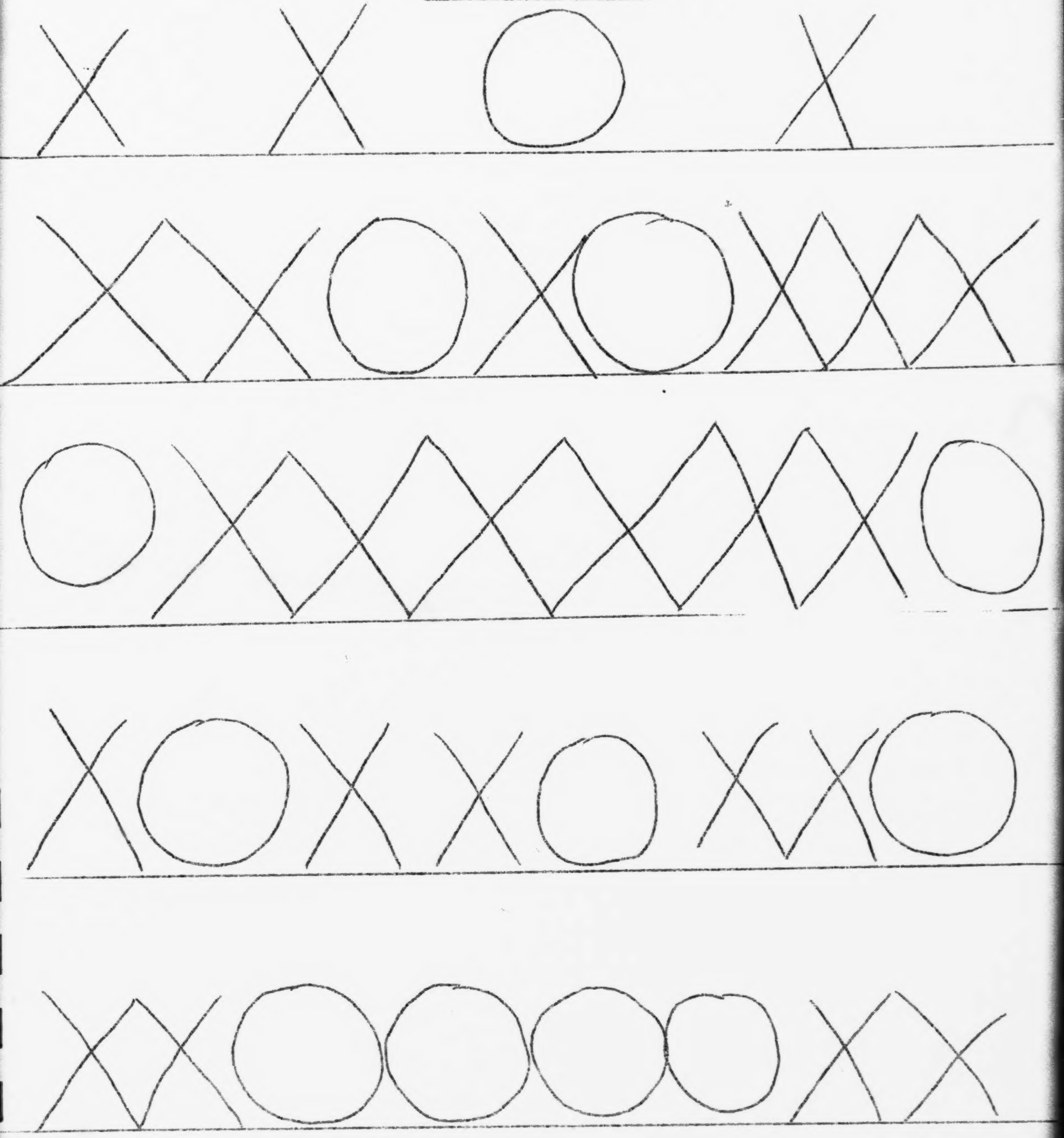
4. Draw something different in each circle.

This is a ditto with 9 circles. There are 9 symbols shown along the side. To begin with have the pupils put a different symbol in each circle. Later on perhaps these can be cut off and the children can make up their own different symbols to go in each circle, but they must all be different.

FIV

Graphic - Differentiation - Thursday

Draw Only The Circles

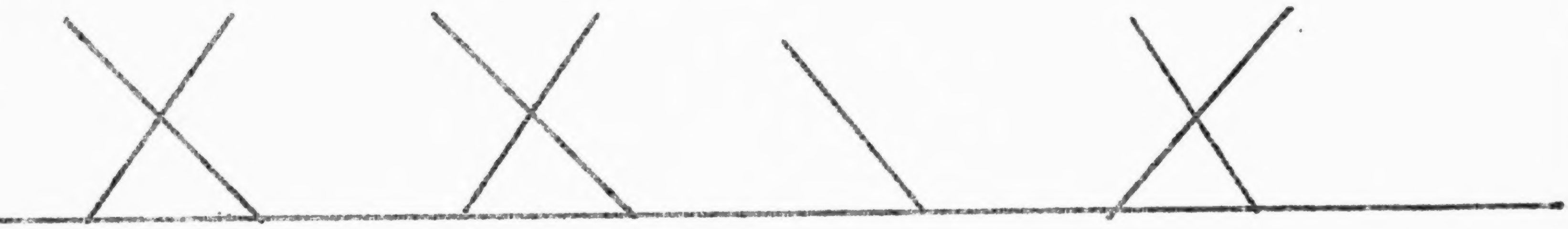


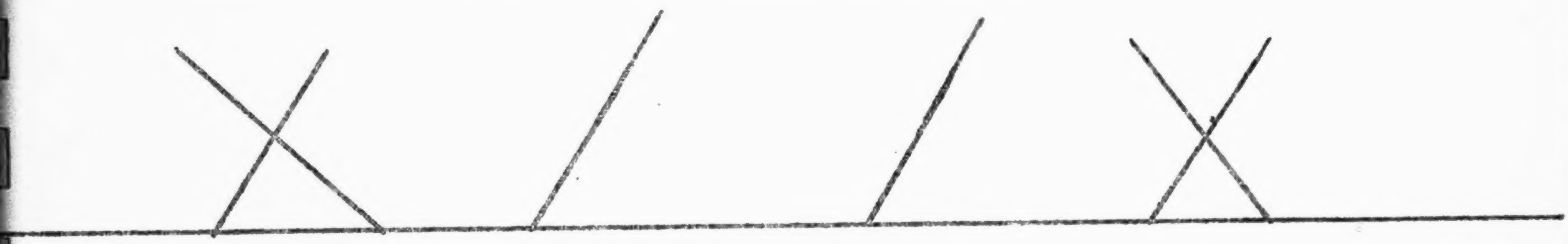
Graphic - Differentiation - Thursday

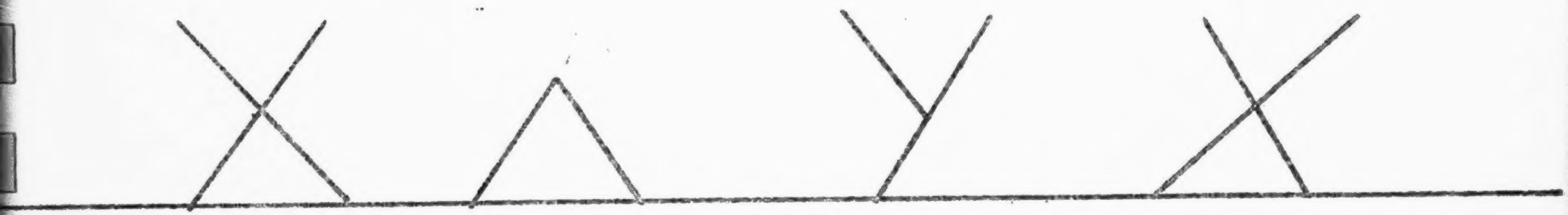
Draw Only The Circles

Graphic - Differentiation - Thursday

Make All the X's the Same

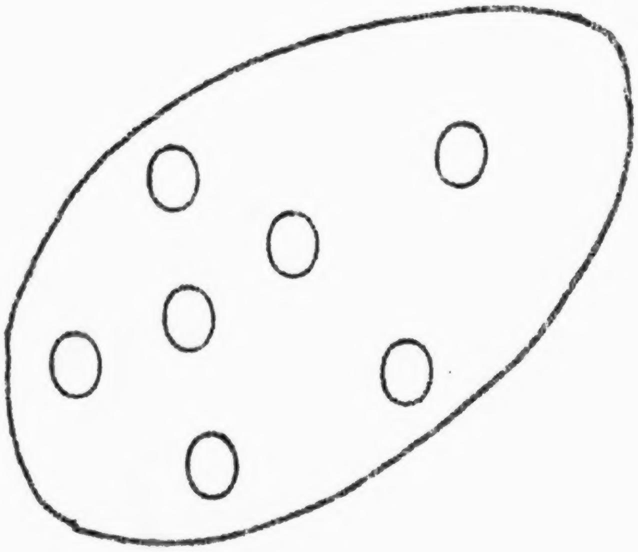


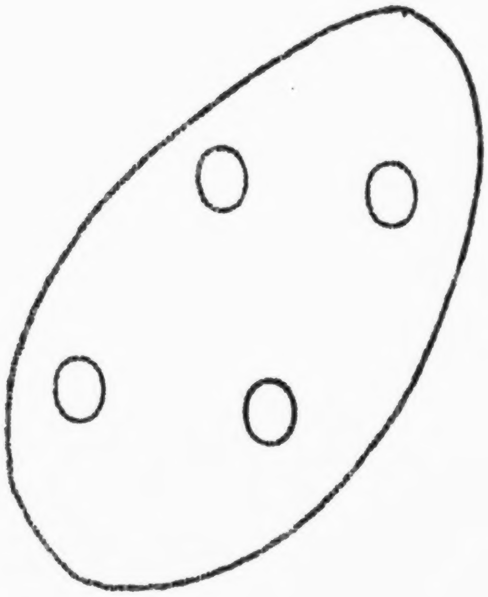


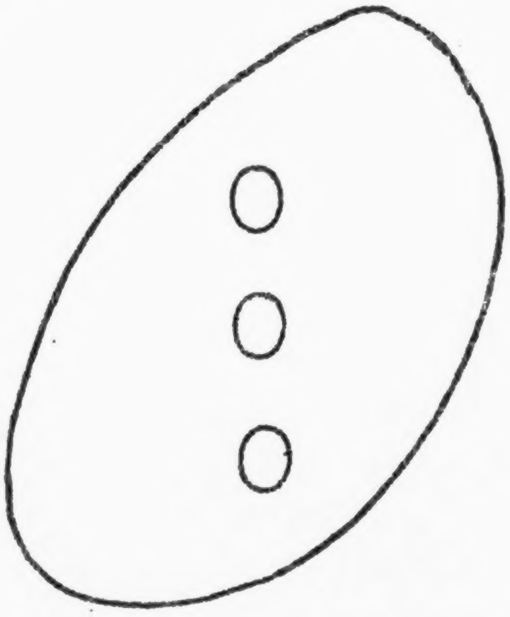


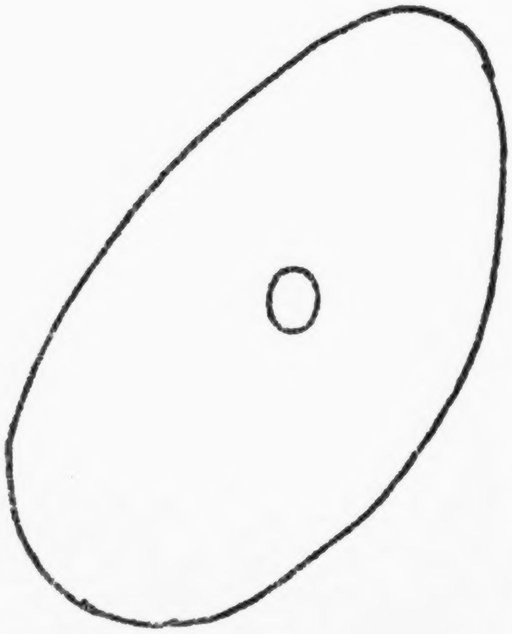
Graphic - Differentiation - Thursday

Give the Eggs All the Same Spots





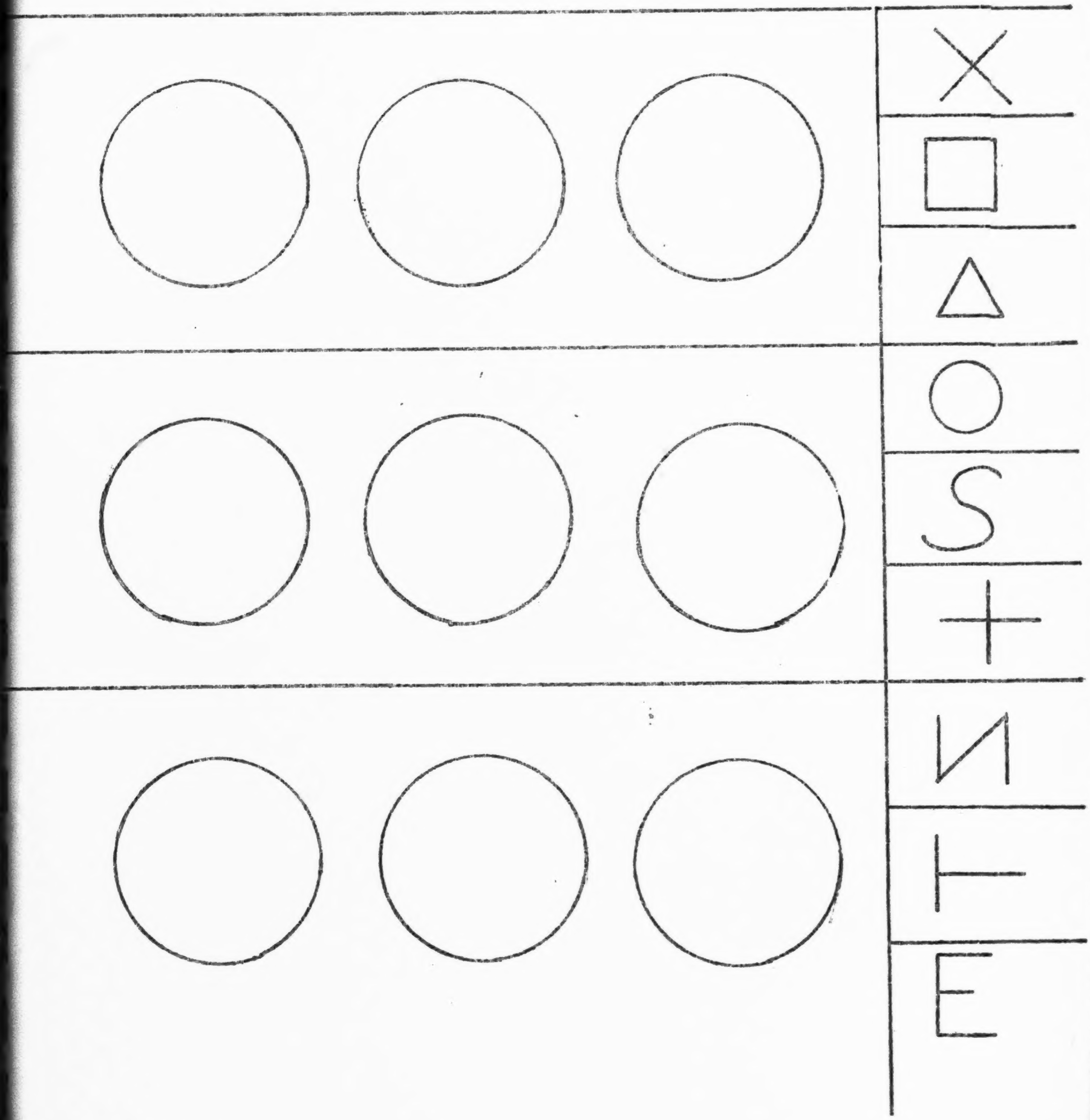




FIV

Graphic - Differentiation - Thursday

Draw Something Different in Each Circle



Graphic - Temporality - Friday

The purpose here is very similar to the other graphic section, except that an effort is made to provide a graphical ordered sequence or pattern.

1. Put circles around the X's.

Give each child the ditto that has circles and X's on it and ask them to put a circle only around the X's. The entire class can do this at one time.

2. Incompleted Drawings

The entire class may do this at one time also. Give each child a ditto of the star, table, and horse, and ask them to put in the missing parts.

3. Reproducing a Pattern

The entire class may do this at 1 time. Give each pupil a ditto that has different symbols on it. Have them reproduce this paper. Make sure they have a crayon or pencil and also a blank sheet of paper to reproduce it on. The emphasis is upon the accuracy of the sequence and not the quality of the marks.

4. Pattern Dictation

This can be done with the entire class. The teacher or leader can direct the pattern verbally, without demonstration if possible. Give the minimal instruction, perhaps "I am going to say 2 things and you make different marks for each--first I'll say up and down, then I'll say back and forth and you make the different marks". For the first attempt show them that up and down means a mark like this , back and forth means a mark like this ____. Then proceed to dictate these simple sequences:

Graphic - Temporality - Friday

5.

a. Two symbol sequences

i. (up-down), (back-forth), (up-down), (back-forth)

ii. (up-down), (up-down), (back-forth), (up-down), (up-down)

iii. (up-down), (back-forth), (back-forth), (up-down), (back-forth) (back-forth)

If all goes well, the patterns should be like this:

i. | — | —

ii. | | — | |

iii. | — — | — —

Continue with as many variations as seem advisable, then shift to a sequence of 3.

b. Three symbol sequence (circle--cross--square)

i. ○ ✕ □ ○ ✕ □

ii. ○ ✕ ✕ □ □ □

iii. ○ ○ ✕ ✕ □ □

iv. ✕ ✕ ✕ ○ ○ ○

Any type of dot-to-dot dittos are also good sequential training.

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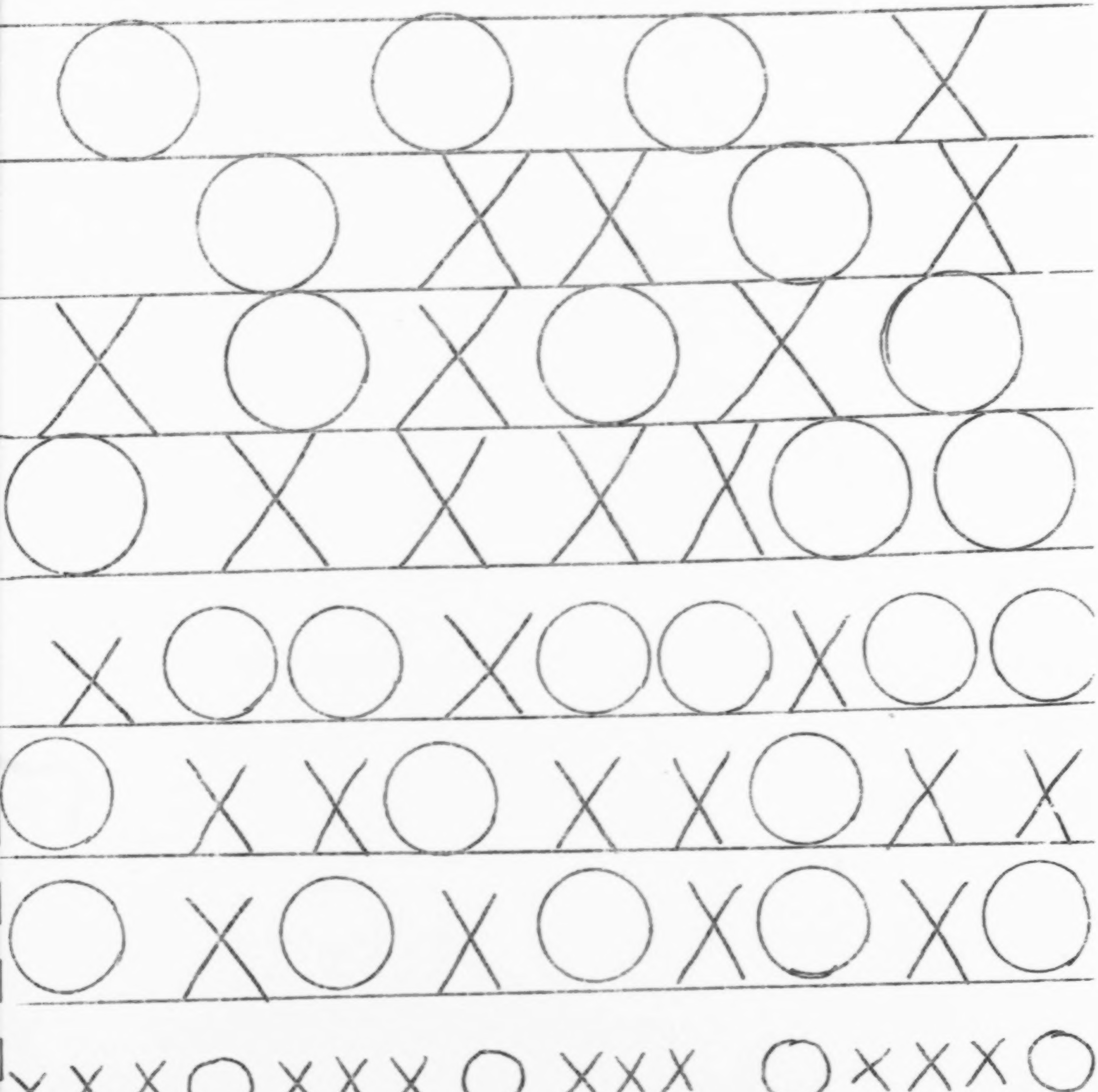
Graphic - Temporality - Friday

Circle All the X's - Ditto



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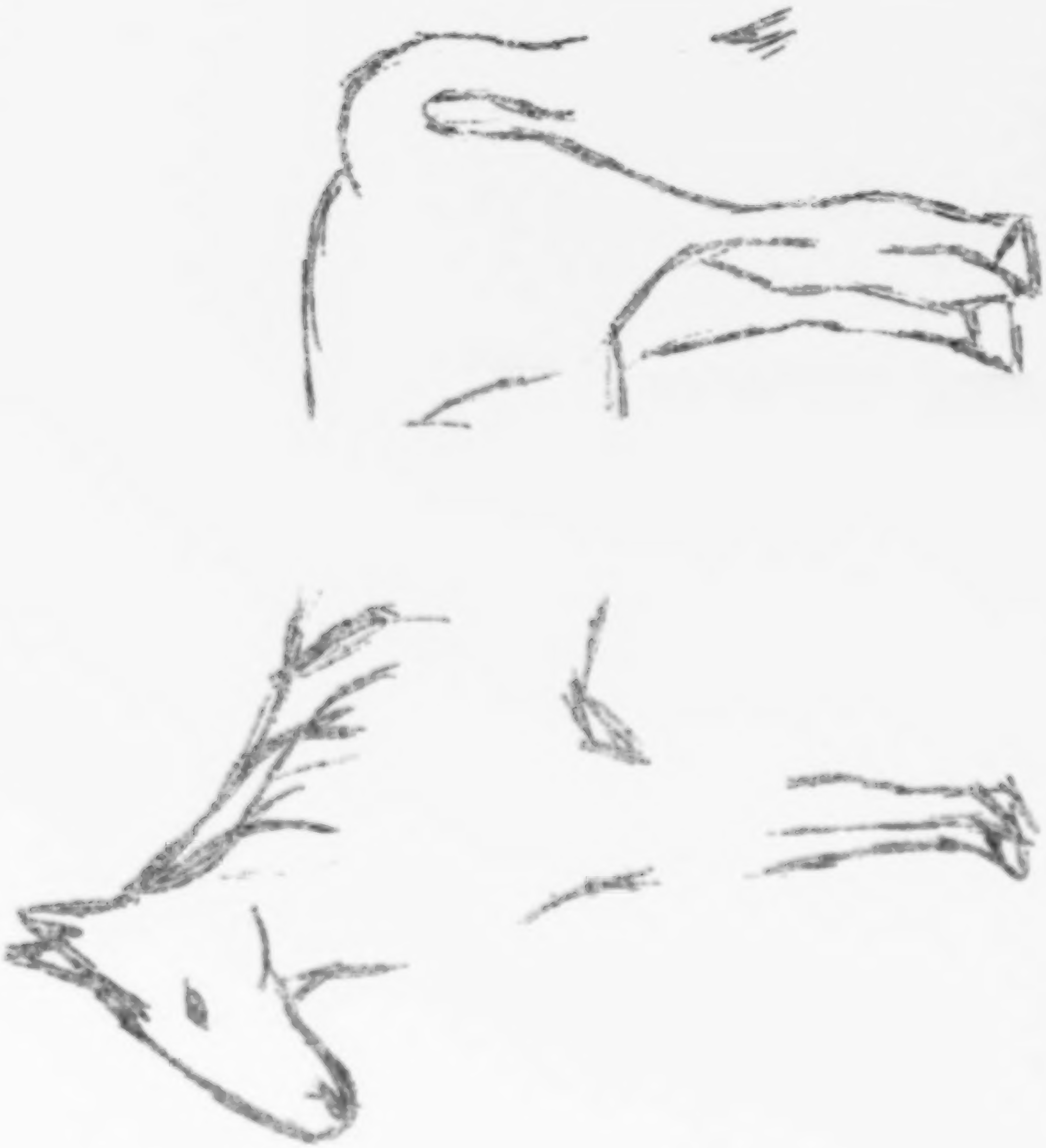
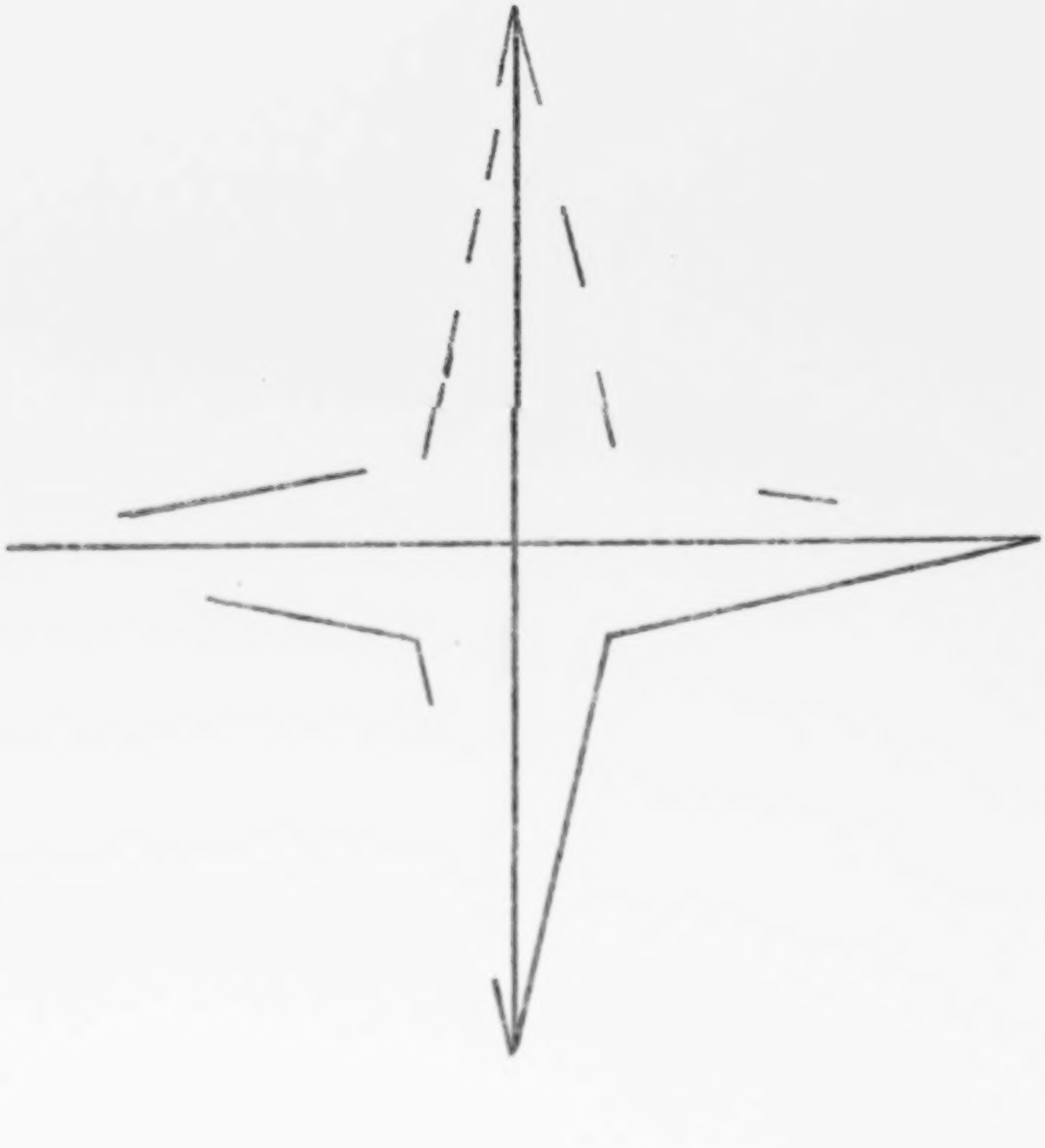
Incomplete Drawing - Ditto - Horse - Graphic - Temporality - Friday



Incomplete Drawing - Ditto - Star - Graphic - Temporality - Friday



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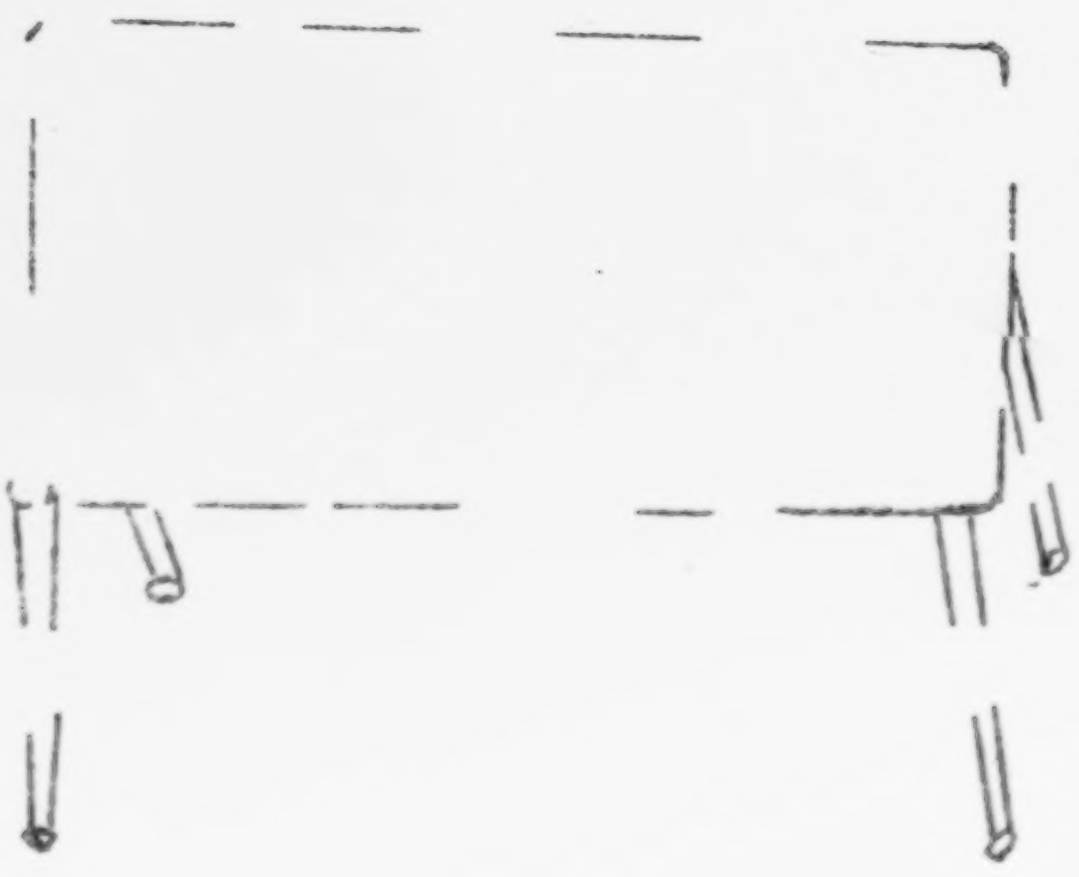
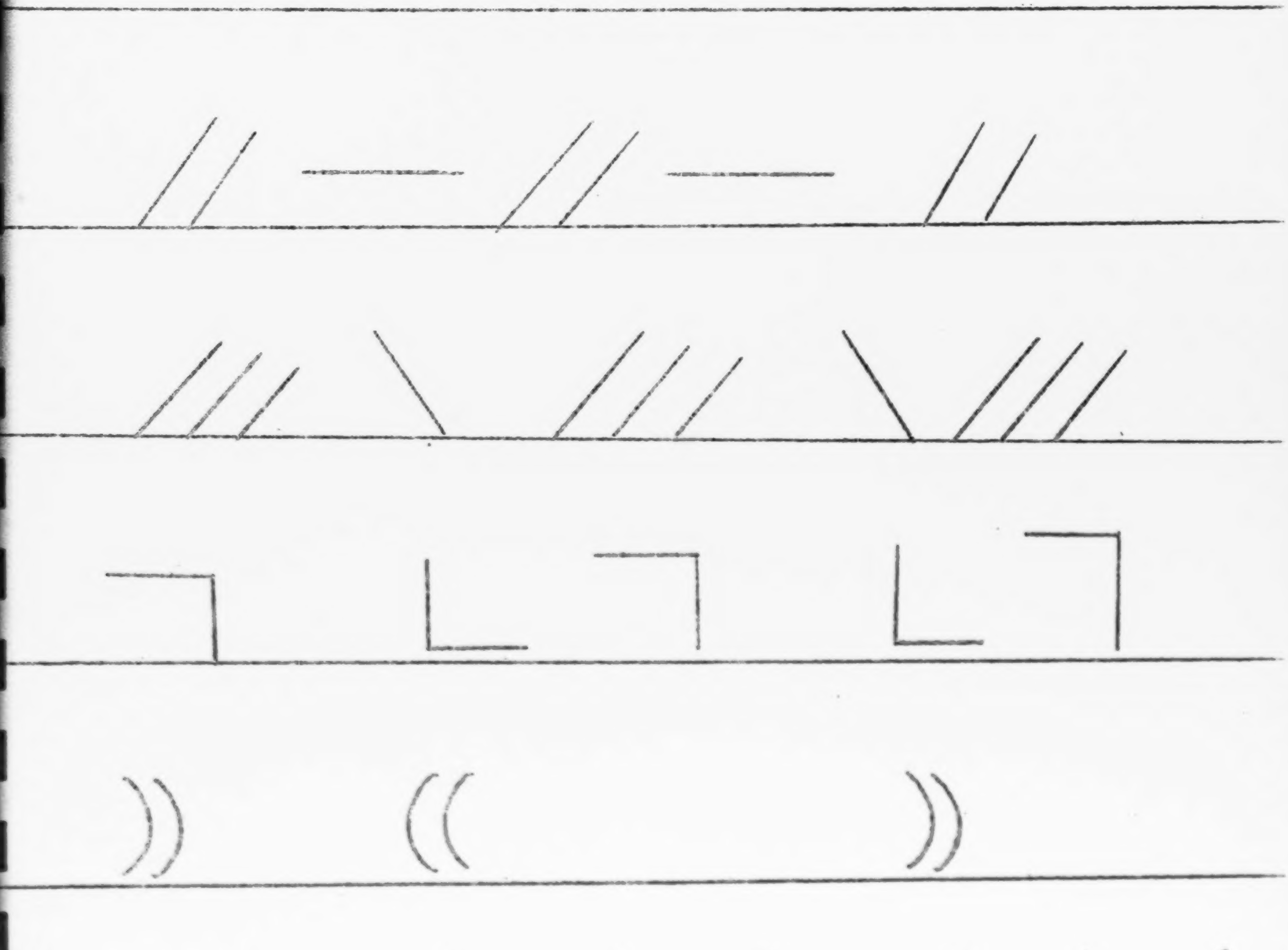
Incomplete Drawing - Ditto - Table - Graphic - Temporality - Friday



Reproducing A Pattern - Graphic - Temporality - Friday



Reproduce A Pattern - Graphic - Temporality - Friday

APPENDIX C

TEACHER EVALUATION FORM

Teacher Evaluation Form

Instruction:

Circle the number best describing the pupils, using one as lowest and nine as highest.

1. Does he show self confidence?

   1 2 3 4 5 6 7 8 9

2. Is he dependent on the teacher?

   1 2 3 4 5 6 7 8 9

3. Does he have his peers do things for him?

   1 2 3 4 5 6 7 8 9

4. Does he have self-control in the classroom?

   1 2 3 4 5 6 7 8 9

5. Does he have self-control on the playground

   1 2 3 4 5 6 7 8 9

6. Is he willing to help others?

   1 2 3 4 5 6 7 8 9

7. Does he share materials and equipment:

   1 2 3 4 5 6 7 8 9

8. Does he have the ability to adjust to new situations or changing schedules?

   1 2 3 4 5 6 7 8 9

9. Could you give him responsible duties in the classroom?

   1 2 3 4 5 6 7 8 9

10. Is he withdrawn?

    1 2 3 4 5 6 7 8 9

11. Does he cry a lot?

    1 2 3 4 5 6 7 8 9

12. Can he compete with his peers?

    1 2 3 4 5 6 7 8 9

13. Does he have the ability to function as a member of a group?

    1 2 3 4 5 6 7 8 9

14. Does he understand the school rules?

1 2 3 4 5 6 7 8 9

15. Does he have respect for school property?

1 2 3 4 5 6 7 8 9

16. Does he complete his work?

1 2 3 4 5 6 7 8 9

17. Does he follow directions well?

1 2 3 4 5 6 7 8 9

18. Can he concentrate for a reasonable length of time? (15 min.)

1 2 3 4 5 6 7 8 9

19. Is he easily distracted?

1 2 3 4 5 6 7 8 9

20. Does he like to feel things?

1 2 3 4 5 6 7 8 9

21. Is he good at games?

1 2 3 4 5 6 7 8 9

22. Does he have good coordination? (running, walking, throwing)

1 2 3 4 5 6 7 8 9

23. Does he look at books?

1 2 3 4 5 6 7 8 9

24. Does he seem to understand them?

1 2 3 4 5 6 7 8 9

25. Does he use his eyes confortably? (no blinking, rolling, squinting)

1 2 3 4 5 6 7 8 9

26. Is he able to hear directions the first time given?

1 2 3 4 5 6 7 8 9

27. Does he speak clearly and distinctly?

1 2 3 4 5 6 7 8 9

28. Does he find something to do when he is through with his assigned work?

1 2 3 4 5 6 7 8 9

29. Does he take care of his clothes, books, and materials properly?

1 2 3 4 5 6 7 8 9

30. Does he know concepts? (up, down, behind, over, through)

1 2 3 4 5 6 7 8 9

31. Does he enjoy listening to stories?

1 2 3 4 5 6 7 8 9

32. Does he remember the stories?

1 2 3 4 5 6 7 8 9

33. Does he demand a lot of attention?

1 2 3 4 5 6 7 8 9

34. Is he destructive?

1 2 3 4 5 6 7 8 9

35. Does he daydream?

1 2 3 4 5 6 7 8 9

36. Does he take pride in his work?

1 2 3 4 5 6 7 8 9

37. Does he understand the difference in time? (long periods vs. short periods)

1 2 3 4 5 6 7 8 9

38. Is he impulsive?

1 2 3 4 5 6 7 8 9

39. Does he know how to use toys?

1 2 3 4 5 6 7 8 9

40. Does he rest quietly?

1 2 3 4 5 6 7 8 9

41. Does he share and demonstrate well before the class?

1 2 3 4 5 6 7 8 9

42. Does he know how to put his coat on?

1 2 3 4 5 6 7 8 9

43. Does he know how to button?

1 2 3 4 5 6 7 8 9

44. Does he know how to use a zipper?

1 2 3 4 5 6 7 8 9

45. Does he know where the materials go?

1 2 3 4 5 6 7 8 9

46. Does he know his way around the school?

1 2 3 4 5 6 7 8 9

47. Does he know the parts of the body?

1 2 3 4 5 6 7 8 9

48. Does he fatigue easily?

1 2 3 4 5 6 7 8 9

49. Can he work puzzles?

1 2 3 4 5 6 7 8 9

50. Does he enjoy music?

1 2 3 4 5 6 7 8 9

51. Does he have rhythm?

1 2 3 4 5 6 7 8 9

52. Is he awkward or clumsy?

1 2 3 4 5 6 7 8 9